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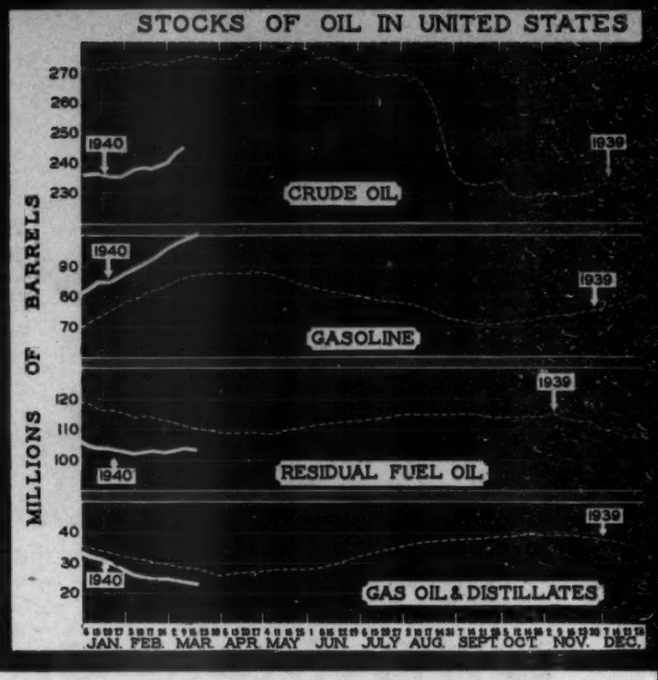
Trends

Government Report Shows Exceptional Increase in Demand



THE exceptionally strong demand position of the petroleum industry in this country which previously had been indicated in partial reports was further revealed this week in the first 1940 report of the Bureau of Mines covering January operations. The increases in domestic demand for crude oil and its products were amazingly high and far exceeded predictions made at the start of the year.

CRUDE PRODUCTION *3,889,964 bbl. daily average—up 63,601 bbl. One year ago 3,389,868 bbl.*

CRUDE STOCKS *245,762,000 bbl. as of March 9—up 1,636,000 bbl. One year ago 272,852,000 bbl.*

GASOLINE STOCKS *100,616,000 bbl. as of March 16—up 1,219,000 bbl. One year ago 86,280,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *103,558,000 bbl. as of March 16—down 267,000. One year ago 110,837,000 bbl.*

GAS OIL AND DISTILLATES *24,075,000 bbl. as of March 16—down 485,000. One year ago 27,358,000 bbl.*

REFINERY RUNS *3,500,000 bbl. daily week ended March 16—up 50,000 bbl. One year ago 3,250,000 bbl.*

The domestic gains over January 1939 range from 7 per cent in the case of gasoline to 70 per cent for petroleum wax. Outstanding was the increase in consumption of products generally classed as burning oils. Domestic shipments of gas oils and distillate increased 34 per cent while the kerosene movement was 31 per cent greater. Other increases included residual fuel oil, 13 per cent, and lubricating oils, 27.5 per cent.

January exports of all these products, with the exception of lubricating oils and wax, were less than those of the same month of the previous year, but the falling off was small in comparison with the domestic increases; and the expansion in total demand (domestic plus exports) for most products was the greatest ever reported for any single month.

While it is certain succeeding reports will not show such high increases as January the data, considered with the demand trends of the last half of 1939, do indicate that new domestic records will be established in 1940 for all the principal products of refineries. Market students also point out in this connection that some recovery in export shipments is to be expected later in the year. This is of particular importance in the case of gasoline, the January exports of which were 37.5 per cent under those of January 1939. A detailed summary of the Bureau of Mines' January report will be found on Page 113 of this issue.

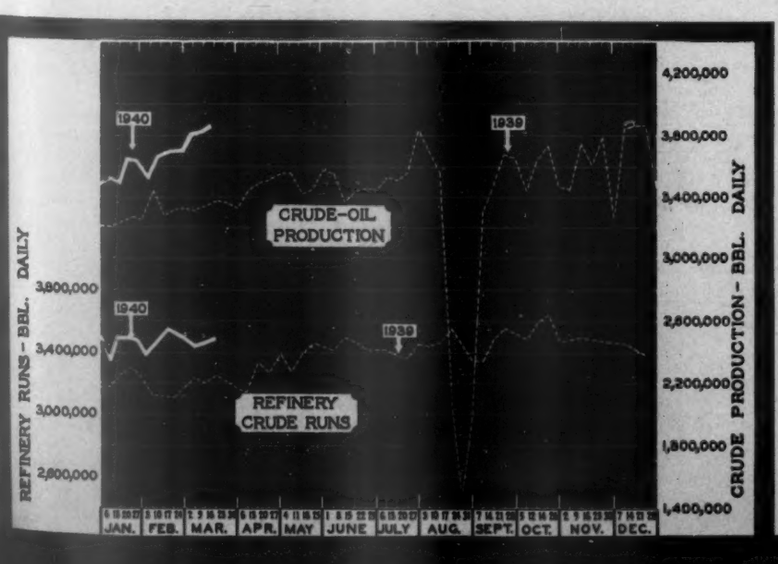
With such demand under way it would be natural to assume that operating conditions in the industry are highly satisfactory. Unfortunately, the trend to overproduce these record outlets continues. Last week a new peak in national crude-oil output was established, the daily average exceeding the previous high of late December by 23,000 bbl. daily.

DAILY AVERAGE PRODUCTION FOR WEEK

	Mar. 16, 1940	Bur. Mines Mar. est. of demand	Mar. state allowable	Mar. 9, 1940
Oklahoma City	93,950	.....	.....	103,250
Seminole field	40,150	.....	.....	39,900
Remainder of state	282,275	.....	.....	283,700
Total Oklahoma	416,375	420,300	420,300	426,850
East Texas	397,000	.....	.....	398,000
West Texas	269,261	.....	.....	271,286
North Central Texas	141,683	.....	.....	141,509
Texas Panhandle	80,290	.....	.....	78,992
East Central Texas	89,346	.....	.....	85,747
Gulf Coast Texas	398,311	.....	.....	388,107
Southwest Texas	113,541	.....	.....	108,894
Total Texas	1,489,432	1,330,600	1,535,600	1,472,535
North Louisiana	67,605	.....	.....	67,555
Gulf Coast Louisiana	212,350	.....	.....	215,000
Total Louisiana	279,955	253,200	277,412	282,555
California	622,500	587,100	592,000	615,100
Kansas	176,750	153,900	170,000	163,500
Arkansas	69,750	65,500	70,000	69,255
Mississippi	8,800	1,300	.....	7,130
Eastern fields	106,200	111,700	.....	108,250
Illinois	455,755	329,700	.....	414,670
Michigan	64,667	64,800	.....	64,558
New Mexico	113,820	103,200	114,000	114,070
Rocky Mountain area	85,960	79,300	.....	87,590
Total United States	3,889,964	3,500,600	.....	3,826,363

While the crude market is generally tight, developments over the past month in crude-oil and refined-product storage show that this current production is excessive by at least 250,000 bbl. daily.

While the gasoline market is holding in the Mid-Continent and Middle West, further price recessions were reported in the eastern part of the United States. Low-gravity fuel oils are not strong in coastal areas. The seasonal decline in furnace oils becomes more apparent weekly. Lack of an export movement for natural gasolines has been reflected in further price weakness.



Yesterday's filling station has become today's service station and merchandise mart. Its manager must be a merchant, not merely an attendant, trained in the intricacies of retail merchandising

Refiners who gave up control of their service stations and leased them to independent dealers find they invited fresh troubles. Evils of the two marketing methods seem to balance. Some new plan, free from the major faults of both its predecessors, is sought

By T. F. SMILEY

Refiners Squirm on Horns Of Marketing Dilemma

HOW the refining industry has been caught on the sharp-pointed horns of a marketing dilemma is brought to mind afresh by the decision of the Sun Oil Co. to take over 40 or more service stations as schools for the instruction of dealers in station management.

Some 5 years ago refiners generally swung from the marginal-contract method of selling their gasoline to the dealer marketing plan, also called the Iowa plan because it was born in that state.

The dealer marketing plan has brought with it discouraging evils, but to escape them by returning to the marginal contract would merely set refiners in the middle of the same troubles that drove them to abandon it in the first place.

Can the shortcomings of the dealer plan be mitigated? The Sun Oil Co. believes so.

Better yet, can the more serious faults of both plans be avoided by adoption of an entirely new one? They're talking hopefully about it.

Announcing the Sun's departure in his annual statement to stockholders, J. Howard Pew, president, refers to the action of the company when it discontinued operating its own stations, leasing them out instead to independent dealers, and he adds this comment, "We believe now that this move was perhaps unduly hasty."

In a later statement, Mr. Pew says the company does not contemplate a return to the policy of generally operating its own stations. The thought in his mind was that perhaps the industry as a whole had acted too hastily.

Varying degrees of dissatisfaction with the dealer plan are expressed by refiners, and there is no unanimity concerning the best way to eradicate its mischievous features. There is hearty oneness in the hope that somebody will devise a method of distribution that will steer clear of rocks in the way of both the dealer plan and the old marginal-contract method which it supplanted.

When Iowa passed its oppressive chain-store tax law in 1935, and other states, hungrily eyeing this new source of revenue, indicated they would enact similar legislation, there was a general movement among oil companies, including the Sun, to turn their retail outlets over to dealers, leasing most of them but selling some outright.

For a while there was a sense of release. The new method of retailing did not perform any miracles, but it did remove some problems, some irritations, and some expense. It enabled companies to avoid the confiscatory chain-store tax. The dealers themselves, no longer salaried employes but business men in their own right, now paid the electricity, telephone, and water bills. The load laid on oil-company backs by the social-security law and later by the wage-hour law, was lightened vastly. And—what a joy!—the dealer himself fixed the pump prices of gasoline. If he wanted to cut prices, and thus automatically reduce his own profits, that was his personal business, something in which the refiner need have only an academic interest. Fine!

Imperfections Revealed

But the rather pleased look with which the refiner formerly regarded the dealer marketing plan has changed to one of doubt and misgiving. Unforeseen imperfections were revealed.

For one thing, many former service-station managers who have been set up in business for themselves as dealers do not measure up to the requirements of the new post.

For another, price cutting—by refiners as well as by retailers—is more rampant now than it was in the topsy-turvy days of the marginal contract.

And both of these conditions mean reduced profits for the refiner.

It had been argued that a satisfactory service-station manager, working on salary, would put even more energy and efficiency into his work if he was the owner of the business he conducted, with his income more definitely dependent upon the quality of his management. And such a dealer's station would increase its volume of business, to the benefit of both dealer and refiner.

Well, in many cases the dealer who leased the station from his former employer fulfilled every expectation. He was of the type that moves to higher jobs in any organization. He had the instincts of the executive. But in an unhappy number of cases the dealer turned out to be a man who, while doing excellent work under the direction of somebody else, did not have the initiative, foresight, and business acumen that are imperative in an independent enterprise.

This failing became more manifest as service stations expanded their activities to include not only washing and greasing, but the sale of various motor accessories. Mr. Pew describes the increasingly apparent weaknesses of the dealer plan:

"Keen competition for gallonage among station operators has disastrously reduced the station's margin or spread for the service it renders and made apparent a need for better-trained operators. It is common knowledge that motorists have many other requirements besides gasoline; they buy tires, batteries, and many other accessories and incidentals; cars require to be washed, lubricated, and otherwise cared for. Experience shows that a service station which is prepared to meet these many needs can largely increase its earnings and so become less dependent on sales of gasoline and lubricants. The establishment, in short, must be converted into a merchandising and servicing center. Unfortunately, many men who are quite competent to dispense oil and gasoline are not trained for the more varied activities of what I may term the integrated service station."

Mr. Pew expresses belief that the policy of establishing model stations for the education of dealers "will solve some problems of retail distribution that in recent years have been particularly difficult."

Under the old method of company-operated or company-controlled stations the refiner maintained close supervision. The kind of employes, the hours of duty, quality of service, sanitary conditions, the general appearance of the premises and the care of equipment were watched closely. Now all that is outside the refiner's jurisdiction; but if his products are sold under their house-brand names—and they usually are—his reputation rises or falls with the character of the station.

One of the jobs which the dealer plan was expected to execute with conspicuous dash and expedition was that of stabilizing the refinery and tank-wagon price structures. And for a time its achievements in this respect were highly encouraging. Under the old marginal-contract dispensation, in the decade between 1925 and 1935, price

cutting had developed into a fine art. It involved the refiner, the jobber, and the retailer. The producer too, for the price of gasoline is an important factor in the price of crude. With the introduction of a system under which the retailer was taking money from his own pocket if he cut prices, the practice for a time lost its charm. Better days for the whole industry seemed to lie ahead. And then the same old curse crawled stealthily into the happy scene.

Here was a station, formerly operated by a manager and one or two helpers, on salary and working a fixed number of hours daily. Under the new arrangement the one-time manager (now the lessee) decided perhaps that he could run it with the help of the missus and the kid. And they ran it as many hours out of the 24 as they pleased. Cost of operation was much less than it had been under company management. Why not shave prices a little and get some of the trade now going to that station in the next block? The melancholy story of how underselling, starting thus from one station, spreads like widening ripples of water, is too familiar to require repeating.

Price cutting under the dealer plan developed in more ways than one, but the case cited represents a common type.

Critics of the dealer plan do not blame it exclusively for the demoralized, profitless gasoline market. They merely assert that the plan has fostered certain kinds of price cutting and has proved powerless to stop others. At the same time they concede that no other marketing plan yet tried has shown itself capable of extinguishing this evil.

In this connection it is recognized that transportation—rail, water, pipe line, truck—has come to be an immense factor in market situations that generate price cutting.

There is no reason to believe that with all the failures of the dealer plan there is any general disposition to abandon it unless something definitely better is proposed.

Although Iowa's chain-store tax was the immediate cause of a rush to the dealer plan, there had been, as a matter of fact, many stations under dealer operation long before the chain-store tax was conceived. The Mid-Continent Petroleum Corp., for instance, had about 35 per cent of its stations so operated, not because of any tax but because it believed the plan a good one.

Mid-Continent's attitude coincides closely with that of other important companies, who say their dealers have maintained satisfactory housekeeping conditions and give good service. The incentive to build up their own businesses seems to produce better results than are attained with salaried employes. These companies agree that there is much to be said on both sides.

"Even if the chain-store tax were removed in states where it is operative I don't believe more than 60 or 70 per cent of the stations would go back to company operation," said the general sales manager of a large integrated company. "The cost would be too great. Remember, we would have to take on all the expense of the social-security accounts throughout a network of retail stations; we would have to pay the ruinous chain-store tax in certain states; we would have to assume the burdens attaching to the wage-hour law; there would be union-labor activities to contend with. And what would we accomplish? Market stabilization? Of course we wouldn't. I still believe a man will do better work if he is running his own business than he will on salary."

"With all its defects the old way was better than the new one," declared another sales executive.

"We have never entirely given up operation of our own service stations," says the general sales manager of a major company, "and we sincerely believe there is a place for both types of operation, dealer-lessee operation in some places proving itself to be more desirable and in other places company-salary."

Absence of any leadership in establishing tank-car prices was named as one of the serious weaknesses of the dealer plan by a sales executive who nevertheless believed nothing would be gained by going back to the marginal contract.

"Practically all the stations we own are under lease to dealers, and we contemplate no change," said the sales manager of one of the majors.

"We are in the midst of studying this situation," said the sales manager of another major.

"We feel more kindly toward company operation than we did," said the sales manager of one of the large independents. "We are beginning to believe we would be better off with three or four properly conducted stations than with many times that many in the hands of dealers." He added, "But we can't take the initiative."

And so the varying views run. All concede iniquities of both the dealer plan and the marginal-contract plan. All fervently wish for the emergence of a new marketing system into which the price cutter cannot squeeze his slippery way and which will insure high standards of service.

A Possible Solution

In discussions of present-day marketing problems one suggested solution that possibly is considered more often than any other looks to abandonment by refiners of their bulk plants and leasing them to jobbers, each of whom would handle his lessor's products exclusively. His relation to the service-station operator would be the same as the refiner's is now. The jobber of course would take over the social-security and wage-hour responsibilities involved.

It is argued that such jobbers, operating in definitely fixed territory and cooperating with other jobbers in the same territory, could prevent gasoline prices from falling to the absurdly low levels they have reached in recent time and that the higher revenue received by both the refiner and the jobber would more than compensate for such disadvantages as might be found in the plan.

The fact that a recent judicial decision declared bulk plants subject to the chain-store tax increases the attractiveness of this plan to the refiner. Whether the service stations supplied by one of these jobbers would be subject to the tax or not would depend upon whether the jobber elected to lease them to dealers or to operate them with salaried employes.

A problem that might develop in this suggested plan lies in the fact that when the dealer marketing plan was adopted many of the high-class jobbers, recognizing that their business was going to be affected adversely (since the refiner would deal directly with the station manager through the refiner's own bulk plant), went into other lines of business. It is declared satisfactory operation of the plan demands that the jobbers be men of high caliber, free from the price-cutting mania.

NEXT WEEK

ANNUAL REFINERY NUMBER

Including . .

Articles featuring latest developments in refinery technology

•

Pictures of 125 plant superintendents and operating executives

•

Several pages of refinery operating ideas or "gadgets"

•

Personnel of companies and plant data in U. S., Canada and Mexico

SPARKS . . FROM THE NEWS

AMNESIA: After months of the T.N.E.C. (monopoly) investigation and the Cole committee hearings a U. S. senator last week introduced a bill to investigate the oil industry. A case of amnesia?

TROUBLESOME RECORD: An unwanted record last week was an all-time peak in national crude-oil production. The trouble with the record is that too much of the production went into storage as crude oil or refinery products.

BAD FOR THE PESSIMISTS: The chronic pessimists will get little comfort from the amazing consumption situation revealed in the latest B.of M. report covering January operation showing following percentage increases in domestic demand for products: Gasoline, 7; kerosene, 31; gas oil, fuel oil and distillate, 27; wax, 70.

CLOSE SPACING: In "Little Tulsa," comprising two city blocks on the western edge of Centralia, Ill., are 14 producing wells and several drilling, in a space 300 ft. wide and 600 ft. long, or 4.13 acres.

WHAT NEXT? Investigation of tanker-rate increases, so plainly due to war, evidences how far-fetched some of these probes are.

LOUISIANA GULF: Two new pools apparently were discovered in the Louisiana Gulf Monday, and two wildcats in the same area will be tested this week.

DUAL FEATURE: Secretary Ickes is to address the Kilgore, Tex., Chamber of Commerce on March 27 and Colonel Thompson will introduce him. Why not a debate?

STRANGE ARGUMENTS: Strange arguments are being offered in justification of high Texas allowables, one of which is that the storage emptied in the shutdown last August should be refilled. Another is that there is no surplus gasoline.

ENGINEERING PROGRESS: If anyone questions technical progress in producing oil let him read the papers presented to several hundred field men at the A.P.I. Wichita and Los Angeles meetings over the past week.

BLAMELESS: For once, loss of market cannot be blamed on Illinois overproduction. Fire in a Regina refinery is responsible for a cut of 2,500 bbl. daily in the allowable for the Turner Valley, Alberta, pool.

EPHEMERAL: Indicating what ephemeral things deep-well records are, drillers in the Rio Bravo field of California have started work with an outfit designed to penetrate below 17,000 ft. Up to 1931 not a well in the United States had gone lower than 10,000 ft.

IN THIRD PLACE: Illinois' daily crude production last week passed 450,000 bbl. and the Sucker State replaced Oklahoma in the latter's long-held third-place position in national output. "Will it reach 500,000 bbl. daily?" is the subject of many current arguments.

SURPRISE: Petrolatum, which, rarely gets into the market news, has stirred astonishment by its sharp gains. One big refiner reported more petrolatum sold in January than in all of 1939.

BETWIXT AND BETWEEN: "Six of one and half dozen of the other" is an old saying which apparently applies to the relative merits or demerits of company vs. dealer-operated service stations.

NO CELEBRATION: Monday was the second anniversary of expropriation of oil properties in Mexico. There was no celebration by the affected companies but there was by the government, which in the operation of the properties still appears to have a bear by the tail.

BOTTOM DROPS OUT . . .

This is the site formerly occupied by the rig in the background while a Devonian test was being drilled in Centralia townsite, Ill. The well struck a mine shortly below 500 ft. and while the anchor hole was being made preparatory to running casing, the ground caved in. The rig was then skidded to its present location where another attempt is in progress

Illinois Production Reaches New Peak of 455,755 Barrels

By HARRY F. SIMONS

CENTRALIA, Ill. — Illinois jumped into third position in the list of oil-producing states last week when the basin fields reported a daily average production of 446,122 bbl. and the old fields reported a daily average of 9,633 bbl. to total 455,755 bbl. for the 7-day period ended March 16. It was the sixth time since January 1, 1940, that the state established a new production high, the recent increases being due to the large amount of flush oil resulting from the development of the Devonian lime in the Salem pool, new pipe-line outlets, and the desire of eastern refiners to obtain as much Illinois crude as possible at a price and transportation saving.

Some observers contend the state has already reached its peak and that the decline will start soon while others are claiming a top of over 500,000 bbl. before the production from the area starts falling. Peak production is expected in the next 3 months.

There has been a noticeable stiffening of the price in Illinois during the past 3 weeks due to the impending opening of the Great Lakes for barge shipment of crude oil to refineries located along the lakes as well as along the St. Lawrence River. The price factor has gradually forced more and more eastern refiners to purchase Illinois crude until there is practically a competition to obtain production from the area. Sohio Corp., principal purchaser of crude in the basin fields, recently raised its price for over-the-allowable oil (pipe-line proration) to $1 per barrel, just 5 cents under its regularly posted price; in addition, the old fields on the eastern side of the basin have found a ready market for their oil with production in that area rising to the highest point since November 4, 1939. (Fig. 1.)

Estimated Market 700,000 Bbl.

Market for Illinois oil was recently described as being in excess of 700,000 bbl. by J. T. King, president of Kingwood Oil Co., and at that level the basin fields have only to develop production and construct pipe-line facilities to meet this market. Illinois history to date has shown that where the production warrants it, pipe-line construction to the marketing points will not be long delayed. The problem therefore becomes one of discovering new sources of oil and the development of the fields.

Practically all of the recent increase in oil output has come from the Salem pool where the Devonian lime has demonstrated a huge flush production. Since the first of the year 131 wells have been completed in that horizon for a total initial potential of over 500,000 bbl. Texas Co. has completed 46 wells for a total initial of 185,412 bbl., Magnolia Petroleum Co. has completed 38 for total initial of 116,015 bbl.; Shell Oil Co., Inc., has completed 21 wells for a total initial of 59,721 bbl.; Ohio Oil Co. has completed 8 wells for a total initial of 21,505 bbl., and independents have completed 19 wells for a total initial of over 70,000 bbl.

While these wells were being completed, production in the state jumped from 332,500 bbl. to 455,755 bbl., a rise of 123,255 bbl. Production in Salem jumped from approximately 181,000 bbl. to 291,000 bbl., a rise of 110,000 bbl. credited directly to Devonian. The production from the Devonian has been estimated in excess of 150,000 bbl. daily for a number of weeks as several companies have drastically reduced the production from the wells completed in shallower sands in the field; some other companies have at the same time opened up the shallower wells in an effort to meet the demands of their customers.

Changes in production are partially shown by the following tabulation:

Company—	Week ending— Dec. 31, 1939 Wells	Production	Mar. 9, 1940 Wells	Production
Texas Co.	919	100,000	1,012	121,000
Magnolia Pet. Co.	220	32,000	263	48,000
Shell Oil Co., Inc.	67	7,500	90	30,500
Ohio Oil Co.	93	10,000	95	14,000
Kingwood Oil Co.	27	11,000	31	10,000
W. C. McBride, Inc.	21	3,350	25	7,200
Tide Water Asso. Oil	5	400	5	340
Miscellaneous	217	21,500	217	30,000

Pipe lines handling this oil at the present time are as follows: Texas Pipe Line Co., 118,000 bbl.; Magnolia Petroleum Co., 48,500 bbl.; Shell Oil Co., Inc., 30,000 bbl.; Sohio Corp., 22,000 bbl.; Western Pipe Line Co., 14,000 bbl.; Central Pipe Line Co., 10,000 bbl.; W. C. McBride, Inc., 7,200 bbl.; Allied Pipe Line Corp., 5,100 bbl.; Consolidated and Canyon Pipe Line companies, 3,000 bbl., and Potter Brothers, 1,600 bbl.

A study of the average initial production for the Devonian completions by week reveals to some extent the decline to be expected in production from that horizon. During the first 7 weeks of the year, the average initial production from completions increased due to the development of areas located better structurally and areas which contained the best porosity and permeability. (Fig. 2.)

Since then there has been a downward trend although there is still enough virgin territory left to sustain the figure at a fairly high level. More significant is the decline in the older areas, completions for the week ending March 9, including five wells that made less than 500 bbl. initially and a pair that made less than 1,000 bbl. initially. These were located in areas which contained wells which had been producing from the Devonian for several months. Several recent completions that were adjacent to wells which made in excess of 3,000 bbl. initially, have required the installation of pumps before they could be tested.

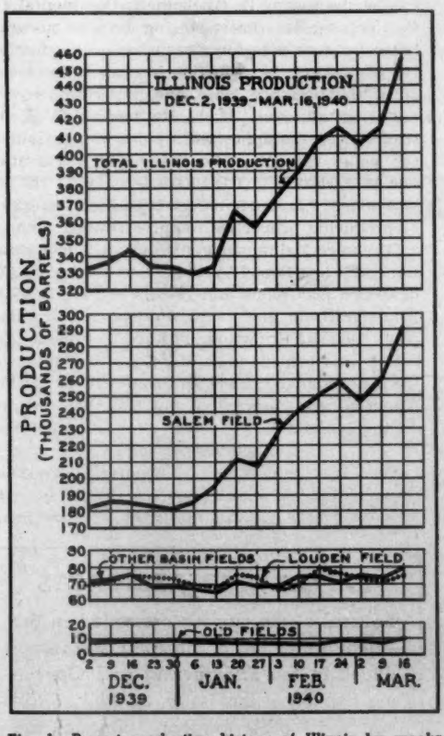


Fig. 1—Recent production history of Illinois by weeks showing total production, Salem field production, Louden and other basin field production and production from old fields

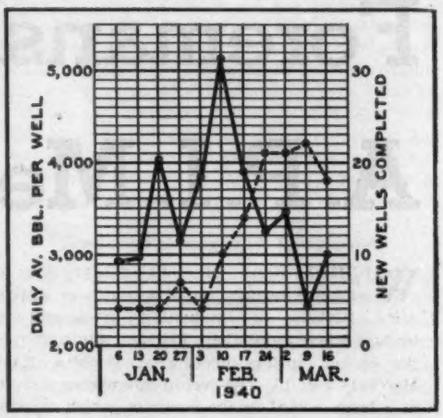


Fig. 2—Solid line shows average initial of completions by weeks; broken line shows completions by weeks

Last week a new well, a neighbor to wells which made headlines because of their high initial, made an initial under 2,000 bbl., less than one-fourth of the wells completed in the same area 2 months ago. Seven wells tested during the week, but not recorded as completions, had a total initial of 971 bbl., an average less than 140 bbl. initial. Actual production history of several wells shows that the Devonian lime has a severe decline, several wells showing declines of from 50 to 90 per cent in a little over 2 months' time.

This is illustrated by production of two operators who completed several wells early in the life of the field. On the first of the year, one operator had two Devonian wells with a production of approximately 6,000 bbl. and during the week ending March 6 the same operator had six Devonian wells with a production of about 5,700 bbl. The second operator obtained his first Devonian well during the middle of January for an initial of approximately 7,500 bbl. daily and since that time has added four more Devonian wells but now has a production from that horizon of about 3,800 bbl. daily, an average of 760 bbl. per well. The aver-

(Continued on Page 34)

Shown at the left above are officers of the Production Section, Mid-Continent district of A.P.I. They are H. E. Miller, Lario Oil & Gas Co., vice chairman for Kansas; Herbert Goodpaster, Kerlyn Oil Co., secretary and treasurer; T. J. Hamilton, Mid-Continent Pump Supply Co., newly elected chairman, and C. H. Keplinger, Shell Oil Co., Inc., retiring chairman. In the center is Russell S. Knappen, Gulf Refining Co., vice chairman for Oklahoma. At the right are water-flood engineers appearing on the program. They are R. R. Hawkins, consulting engineer; Lynn C. Converse, Max B. Miller & Co., Inc.; Jack Powell, Brundred Oil Co., and W. S. Walls, Phillips Petroleum Co.

Foremanship Given Emphasis at A.P.I. Meeting at Wichita

By PAUL REED and HARRY F. SIMONS

WICHITA, Kans., Mar. 16.—All previous attendance records for Mid-Continent district, A.P.I. Division of Production, meetings were broken when more than 750 men registered for the annual spring meeting at Wichita, Kans., March 14 and 15. The record attendance was due to a large extent to the program which featured papers of wide interest to production men. Discussions were led by oil company executives, superintendents, and technical men; special attention was paid to developments in Kansas and Mid-Continent production practices.

T. J. Hamilton, Mid-Continent Pump Supply Co., Oklahoma City, was elected chairman for the ensuing year at the Friday morning session. Other officers elected were H. E. Miller, Lario Oil & Gas Co., Wichita, Kans., vice chairman for Kansas; R. S. Knappen, Gulf Refining Co., Tulsa, Okla., vice chairman for Oklahoma; George Berlin, Skelly Oil Co., Pampa, Tex., vice chairman for the Panhandle, and Herbert Goodpaster, Kerlyn Oil Co., Oklahoma City, secretary-treasurer. C. S. Warren, Cities Service Oil Co., was elected chairman of the nominating committee.

The next session will be held at Amarillo, Tex.

An innovation in the program was the special emphasis placed on foremanship, the subject of a preconvention conference on Wednesday evening as well as that of a paper by H. E. Zoller, Derby Oil Co. Chairman Henry Keplinger, Shell Oil Co., Inc., pointed out in his response to the address of welcome that foremanship training was receiving the attention of operators in the Wichita and Kansas area generally. Considerable impromptu discussion followed the delivery of a paper analyzing cable-tool drilling from an engineering viewpoint.

H. E. Miller, Lario Oil & Gas Co., chairman for Kansas, who was presiding chairman at the Thursday morning session, opened the meeting by introducing Ralph Pryor, of Lockhart & Pryor, a director of the American Petroleum Institute, who made the opening address. Following the response, Henry Keplinger, Mid-Continent chairman of the Institute, introduced L. R. Van Arsdale, Pittsburgh Equitable Meter Co., who delivered a paper on "Oil Meters of the Positive-Displacement Type." In the discussion E. O. Bennett, Continental Oil Co., pointed out that metering is more accurate than the gage pole for measuring oil production. He also told of the reduction in evaporation losses at a high-pressure lease and described several meter installations. H. E. Heithecker, U. S. Bureau of Mines, emphasized a point brought out in the paper regarding the changes in registration due to variation in the characteristics of the oil, and added that the satisfactory use of meters on oil-producing properties requires trained men.

"Pressure Maintenance at Cunningham, Kansas, Lansing Lime Pool," by Colin Rae, Skelly Oil Co., described conditions and results observed in the first significant project for repressuring of a lime pool. Don R. Knowlton, Phillips Petroleum Co., said it was evident from Mr. Rae's description of the operations that there has been little bypassing. Attention was directed to the fact that the producing horizon is an oolitic lime and therefore has characteristics similar to sand.

Arnold R. Jones, state Corporation Commission of Kansas, substituted for Gov. Payne H. Ratner who was unable to attend. He was introduced by A. S. Ritchie, McPherson Drilling Co., and said the Cole federal oil bill was probably dead. He pointed out that production men could do more to keep it dead than any other part of the industry. This could be accomplished by producing oil in such a way that there can be no excuse for federal control. In regard to suits pending in Kansas courts affecting rulings of the state Corporation Commission, he said the commission welcomes such suits at the present time since there are not enough judicial determinations. The decisions will provide mileposts for guiding the course of future rules and regulations.

R. B. Kay, independent operator, of Amarillo, Tex., presiding at the afternoon session, introduced H. E. Zoller who shortened his paper, "Foremanship," to keep the meeting on schedule. He called attention to the fact that the foreman is in the key position between the workmen and the management and it is better to show the men in the field the benefits resulting from performing an operation in a particular manner than to get work done by blunt commands. His concluding remark was: "Friendly, helpful cooperation costs nothing but pays rich dividends."

J. Forrest Ihinger, Kansas State Board for Vocational Education, offered the services of his organization for training foreman.

"Larger Gas Fields in Kansas" was the title of a paper delivered by J. H. Page, Kansas State Corporation Commission, which was followed by a discussion by C. E. Brock, Kansas Power & Light Co., and James Fields, Morgan, Cobb & Flynn. Mr. Fields emphasized that the principal concern of the operator in gas development is the dollar recovery per acre. The paper, "Submergible Electrical Centrifugal Pumping Units and Their Application," by P. E. Loye, Reda Pump Co., was followed by short talks on operation of this equipment by L. H. Thawley, Phillips Petroleum Co., and Pat McDonald, Indian Territory Illuminating Oil Co.

(Continued on Page 34)

PAPERS AND ABSTRACTS

Several of the papers presented at the Wichita meeting of the A.P.I. are reproduced in the Engineering and Operating Section of this issue, as well as abstracts of other papers. One of the papers was published in last week's issue, Page 42.

Outline of Direct and Indirect Means of Locating Oil

By W. V. HOWARD

This is the second of a series of articles on modern exploration and development. Later articles, dealing with specific techniques and methods will appear in Engineering and Operating Section

THE search for oil embraces many phases of many sciences. The geological profession has developed many techniques during the past 80 years, both in the field and in the laboratory. Other scientific developments have been pressed into service and each of these has sent us farther afield in our search for aids in deciphering the geological riddles that are hidden, often below more than 2 miles of solid rock.

The first, and most obvious, attempts were made in the field of discovering oil directly. An oil seep on the surface obviously means that there is a reservoir of oil at depth which feeds the seep. In many cases, wells drilled near seeps brought in new fields. Sometimes it was found that most of the oil which had formerly been in the reservoir had already escaped.

In almost every district where oil is found, the search begins with drilling near seeps, but their number is very limited. Other substances, such as "paraffin dirt" are recognized as a form of oil seep and these occurrences are explored. During the past decade, Russian geologists have developed a method of discovering minute seeps of oil and the practice of "soil analysis" was soon transported to America.

Naturally, a whole series of "oil finders" have appeared on the scene. These range all the way from the wiggle-stick to complicated apparatuses for measuring the waves which are supposedly given off by oil deposits or are absorbed by them. Some highly sensitive individuals were able to throw fits over an oil deposit, although they could drive into a filling station without a tremor. So far as is known, however, there is no method, physical, psychic or supernatural, which can lead directly to the discovery of large pools of oil at depth other than the discovery of small amounts of oil or associated substances at the surface.

A much more fruitful line of research was advocated by three geologists as early as 1860. These geologists held that oil was found in anticlines and that, although all anticlines did not contain oil, the probability of drilling a successful wildcat on structure was greater than the probability of success offstructure. Here a wide field was opened up and for the next 65 years, almost all of the exploration carried on was a search for traps.

Structural Principles Clinched

Many wildcatters found oil that was not associated with anticlines, but this oil was found to have some sort of a structural relationship and often added to the growing list of structural features which formed traps. In many cases, the structural control seemed to be very vague and it was necessary to explain occurrences of oil on the basis of lenticular sands within the series. Some geologists even referred to "acinal structures" which meant "structures without structure," but by 1930 it was recognized that every so-called exception to the structural theory of oil accumulation was actually found to clinch the structural principles more firmly than ever.

In the early days, the great majority of structures were found by surface mapping. Where dips were observable, the technique of field mapping was used which has been in vogue since the beginning of the science. The discovery of the Tinsley dome in Mississippi in 1939 was due to surface mapping in an area where an outcrop of a formation was found to be unexpectedly high. In areas of strong folding, such as the eastern fields, Wyoming and California, structures could be found by the dozen by anyone who had been exposed to the most elementary principles of geology. In the Mid-Continent, however, where dips were very flat, careful mapping and leveling were necessary.

Geologists have frequently issued warnings that the number of structures which could be observed by surface mapping were limited, but such structures are still being found even in areas which have been prospected for many years.

A field geologist, engaged in surface mapping, does not consider his map complete until he has shown by means of cross-sections how the formations extend underground. Drilled wells confirm or modify these determinations, provided the formations encountered can be correlated with known exposures, or with one another. For many years geologists used both lithology and paleontology in making these correlations.

Correlation of formations by lithology proved to be very valuable in dealing with formations encountered underground, but paleontology, as practiced by field geologists was rather less useful. Fossils found in the field are generally of large size and these are pulverized by the bit. Economic paleontologists did not permit this to interfere with the use of faunal correlations, however, and developed the science of micropaleontology which deals with shells of microscopic size which could be extracted from well cuttings. The use of purely geological methods in correlation and determination of structure limited the industry to examination of observed material and it became necessary to devise other methods of locating structures on unseen rock formations.

Torsion Balance and Gravimeter

One principle which lent itself to early development was that in general, rocks which lie far below the surface are heavier than those which lie near the surface. If a method could be devised whereby minute changes in gravity could be observed, these would indicate the places where the heavy rocks rose towards the surface. This elevation might be due to structural movements, or to the actual introduction of heavy rocks by intrusion, but the problem was to find the gravity anomalies and interpret them later. The torsion balance and gravimeter were used in this work.

TRAFFIC SNARL IN SALEM POOL, ILLINOIS . . .

Here is shown a traffic tie-up in the Salem pool. The road was improved by oil companies operating in the field but winter weather turned it to a plastic mass. This point is about 1 mile in from the north end of the field and is as far as automobiles and trucks can get without the aid of a tractor

It was also known that everywhere the earth was underlain by igneous rocks, or rocks which were formerly molten. These rocks are more magnetic than sedimentary rocks so that if we could determine areas of abnormally high magnetism, we could find where these basement rocks had been elevated. The dip needle, as used for prospecting for iron, was not sufficiently accurate for the purpose, so that the magnetometer was developed. Use of the magnetometer has been less widespread than might have been expected, mainly because the theory of magnetism in rocks was not adequately understood. Many times, magnetic intensity is altered by the presence of magnetic materials in sediments and this occasionally gives anomalous results. At other times, structures give low readings because the distribution of igneous and sedimentary rocks in the basement do not conform to the configuration of the basement surface and of the overlying rocks. The difficulty of interpretation tended to overbalance the economy of magnetometer surveys, but there is increasing evidence that use of the magnetometer will again become general.

A third basic principle which enables us to locate many structures is the fact that contacts between beds of rocks reflect vibrations, just as a mirror reflects light rays. Once vibrations are set up by means of an explosion at the earth's surface, the reflected or refracted waves can be recorded by a seismograph. The rate of propagation of these waves varies as they pass through different formations and a film which carries a record of the vibrations returned to the surface, together with a method of measuring the time of travel, gives in many cases a very accurate idea of the beds occurring at depth.

Application of Methods

In applying these three methods, geological interpretation of the observations is necessary, as well as a realization that, in some cases, such an interpretation cannot be made.

As in the case of the discovery of direct evidence of the existence of oil pools, a great many other methods were tried which were intended to locate structure. Many of these were based upon sound scientific principles but proved impractical because of complications. In the great majority of cases the complications were due to the fact that measurements of extreme accuracy were required and variation in measurements was due to unpredictable extraneous factors. A device by means of which a current can be projected into the earth and returned to the surface will be rendered impractical by differences in the conductivity of barren horizons filled with salt water. Or a method of determining the presence or absence of oil by noting local variations in radioactivity is complicated by the fact that these variations are more frequently due to irregularity in the igneous basement than to absorption by oil. However, the search for methods of locating structure is by no means ended.

While geophysics concentrated on the field of indirect observation, the correlation of rocks and determination of structures by direct observation is by no means neglected. One of the earliest methods used depended on the fact that the circulation of fluids in geological bodies tends to maintain a constant temperature in that formation. If therefore, a wildcat finds abnormally high temperatures, that indicates that a bed which normally might be expected at greater depths has been uplifted.

Over a fairly wide area, individual beds are found to have concentrations of radioactive minerals which differ in a uniform manner from the concentrations in neighboring strata. It is, therefore, possible to measure the radioactivity of individual beds and correlate them with a known section. In the same way, variations in the resistivity of beds to electrical currents are not only related to the porosity and the nature of the fluid content of a bed, but can be used for correlation if these properties are diagnostic of single formations.

Similarities in lithology which are diagnostic of individual formations can be determined indirectly by noting the time it takes to penetrate the various formations with the drill. In some cases, formations can be correlated on the basis of chemical composition of the water which they contain. In all of these cases, the principle used in making correlation is the same as the basis for correlation established by the paleontologist. The index, whether fossil or mineral content, must have a wide horizontal range and a limited vertical range.

The increase in the number of diagnostic characteristics of rocks has developed contemporaneously with methods of obtaining results. Once a basis of correlation was established, areas could be core-drilled in order to enable us to make the necessary observations. As it became necessary to drill deeper after this information, the practice of drilling slim holes came into being.

In spite of the multiplicity of exploratory methods, there has been little change in the proportion of successful wildcats to failures. This is due to the fact that as time progresses, new pools are becoming increasingly more difficult to discover. At the same time, each addition to the group of exploratory methods is found to have limitations. Some of these limitations are inherent in the method and some are due to geological complications which are unpredictable in the present state of our knowledge. Where a series of rocks has been deposited irregularly over an area, and the area has been uplifted frequently and eroded irregularly, mathematical interpretation of the results of physical measurements often proves misleading. As we find out more concerning the distribution of geological formations, we can recheck many of the results of previous exploration and get very different answers. Frequently, the application of a physical principle to exploration requires a readjustment of our geological theories and if this modification does not take place, there is apt to be a lack of collaboration between different branches of the exploration staff which reduces its efficiency.

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Col. Thompson Files Reply Before Cole Committee

COL. E. O. THOMPSON, Texas railroad commissioner, prevented by illness from testifying before the Cole committee during recent hearings on the Cole federal oil-control bill, filed a statement with the committee last week in which he defended the activities of the Interstate Compact Commission and the 15-day shutdown in the major oil-producing states last August after posted prices were reduced.

Chairman William P. Cole said the committee may still call Colonel Thompson to testify. No time has yet been filed by the subcommittee for action on the bill.

In reply to statements made by government witnesses that the Compact Commission has been unable to work successfully because it has no power, Colonel Thompson said:

"My reply to that is that Texas would not join it if it had the power to force other states to do anything. We do not believe that sovereignty is compatible with force. The compact does have the greatest force on earth behind it," he added, "and that is the power of enlightened public opinion."

Called upon by members of the committee to explain what took place at the Oklahoma City meeting of the commission last August prior to the general shutdown, Colonel Thompson explained that the Texas Railroad Commission, after prices posted in the fields for crude had been reduced 20 cents a barrel, took the initiative. The commission felt that the reduction in price meant a surplus production, he said.

"I called the meeting," he said, "and I told them Texas had already shut down. I did not urge any other state to shut down. We simply talked the situation over and each state made its own announcement as to what it intended to do."

Following the shutdown a survey of stocks disclosed that they had been reduced 30,000,000 bbl. to approximately 23,000,000 bbl. which "seemed to put the stock position in about the right place," he added.

Colonel Thompson also filed with the committee copies of the shutdown order of the commission, as well as other documents of commission actions to show how it operates.

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Tax Board Ruling on Depletion

WASHINGTON, D. C., Mar. 18.—The U. S. Board of Tax Appeals in an opinion by J. Edgar Murdock in two cases brought separately by Marrs McLean and his wife, Verna Hooks McLean, of Beaumont, Tex., against the commissioner of internal revenue, made rulings on oil depletion.

Judge Murdock held that an assignment providing for the payment of specified amounts in cash, an additional amount to be paid in cash out of one-eighth of the oil and an overriding royalty, was not a sale of capital assets, but constituted taxable income. The commissioner was sustained.

A second point concerned the right of the taxpayer to claim depletion for oil in place covered by an assignment of a lease in which the taxpayer retained an interest. The opinion held that contracts purporting to sell or assign the entire interest in a lease in consideration of cash and a percentage of the net profits from operation of the lease result in sales and do not retain for the original owners any economic interest in the oil in place which would entitle them to deductions for depletion but a contract purporting to assign only three-fourths of an interest in a lease and requiring the assignee to operate the lease and pay to the assignor one-fourth of the net profits from operation retains for the assignors an economic interest in the oil in place which entitled him to deductions for depletion.

Judge Murdock upheld the commissioner's determination on the question of deductions for depletion and ruled that depletion reductions could be claimed by taxpayers only upon the amount they actually received from operation of the lease under the assignment contract, and not upon the gross production from the lease.

Pacific Coast A. P. I. Section Meets

By L. P. STOCKMAN

LOS ANGELES, Calif., Mar. 19.—Attendance at the spring meeting of the Pacific Coast district, Division of Production, American Petroleum Institute held in Los Angeles at the Biltmore Hotel, March 19, greatly exceeded expectations and set a new attendance record for both technical sessions during the morning and afternoon, as well as for the evening session.

Gov. Leon C. Phillips of Oklahoma, who was scheduled to be the guest speaker, was detained in Oklahoma at the last minute by litigation and consequently was unable to be present.

R. N. McMaster, of Chanslor-Canfield Midway Oil Co., was elected chairman of the Pacific Coast district succeeding Howard Pyle of Union Oil Co., who becomes chairman of the advisory committee.

Technical interest centered in a paper on "Trends in Allowables in California" by L. L. Aubert, Bankline Oil Co., chairman of the allocation committee of the Central Committee of California Oil Producers, who pointed out that no well in the state would be allowed to produce more than 135 bbl. per day when December 1940 rolled around, if the present method of curtailment was allowed to continue. Another weak spot in the uniform method of allotment now employed was brought to light when he called attention to the fact that a 150-bbl. well at 12,000 ft. and a 315-bbl. well from 9,000 ft. would each have an allowable of 135 bbl. per day. The paper revived the old question as to what should constitute an equitable method of curtailment. Mr. Aubert pointed out that the present method of lowering top allowables and power factors leads eventually to giving too much credit for depth and insufficient credit for potential. It is his opinion that the depth allowable should be gradually diminished and that the power factor should be gradually modified, especially as it affects the larger intermediate wells and the small top wells. Gradual modification of the power factor would have the effect of raising the required potential for top wells. He believes the minimum potential required for top wells should be about 1,500 bbl. per day. The net result of the presentation of this paper and resulting discussion is that some change must be made in the existing method of curtailment as the resistance point will be reached before December 1940.

A paper by C. A. Yeatman on "Practical Utilization of Rate-of-Penetration Drilling Data" received considerable attention and led to prolonged discussion. It will be presented in some of the district meetings. P. H. Jones and Denis Berdine, of Union Oil Co., presented a paper on "Oil Well Cementing Factors Influencing Bond Between Cement and Formation" and this was followed by a paper on "The Application of Chemicals to Drilling and Producing Operations" by W. W. Robinson of Texas Co. Both papers dwelt on factors of importance, one covering tests on hydraulic jetting, mechanical scraping or chemical action for the removal of mud cake, and the other covering the application of chemistry in drilling production. Both resulted in considerable discussion. This year, instead of presenting numerous papers and retarding discussion, six papers were presented and the meeting was then thrown open to discussion, a procedure which found favor as it enabled more detailed personal observations.

E. W. McAllister, of Kettleman North Dome Association, came down from Avenal in the Kettleman Hills district and discussed "Bottom-Hole Control of Gas Production," describing the design and operation of two general types of bottom-hole-flow controls which are adjustable from the surface by means of instruments run on a small wire line. The association has been doing considerable work with bottom-hole pressures. The resulting discussion indicated that this work is of primary importance and will become more vital as time goes on. Several California companies have been making tests and conducting research in the coordination of data with results.

ABSTRACTS, PAGE 71

Abstracts of most of the papers presented at the Los Angeles meeting of the A.P.I. are printed in the Engineering and Operating Section of this issue, on Page 71.

R. N. McMASTER

Who was elected chairman of the Pacific Coast district of A.P.I., succeeding Howard Pyle. Mr. McMaster is associated with Chanslor-Canfield Midway Oil Co.

Panhandle Eastern Rejects Missouri-Kansas Plan

DOVER, Del., Mar. 19.—Stockholders of the Panhandle Eastern Pipe Line Co. here last week voted down a resolution to amend the certificate of incorporation which would have returned stock control to the Missouri-Kansas Pipe Line Co. Panhandle formerly was a wholly-owned subsidiary of Missouri-Kansas. The stock is held by Columbia Oil & Gasoline Corp., Missouri-Kansas, and the public.

Directors elected at the meeting were Gano Dunn, J. D. Creveling, Joseph A. Boser, Robert C. Winmill, William G. McGuire, A. S. Dixon, Robert J. Bulkley, Walter C. Mortland, and Richard C. Patterson, Jr.

L. L. AUBERT *P. H. JONES* *DENIS BERDINE* *E. W. McALLISTER*

Here are a quartet of authors who presented papers before the Pacific Coast district meeting of the A.P.I., Los Angeles, March 19

STATE CAPITALS...

KANSAS

THE CORPORATION COMMISSION has set allowable crude-oil production in Kansas for March at 170,000 bbl. a day, 5,000 bbl. over last month and 16,100 bbl. above the federal Bureau of Mines estimate of March market demand.

Theo A. Morgan, conservation director, said the allowable made no provision for special allowables other than in pools given extra production by court order.

DISTRICT JUDGE F. O. RINDOM Monday, at Hugoton, granted the application of 182 land and royalty owners for a stay restraining the Kansas Corporation Commission from making effective April 1 a gas-proration order in the Hugoton field.

Under terms of the restraining order, the commission cannot put the proration mandate into effect until final adjudication or a new order is issued. The petitioners contended the proration order would cost them $6,000 to $12,000 monthly in royalties. The 182 applicants were required to furnish $2,500 bond pending disposition of the case.

TEXAS

THE DAILY ALLOWABLE PRODUCTION of Texas oil fields climbed to 1,535,600 bbl. as the Railroad Commission increased the allowable in the Van field, Van Zandt County, an additional 5,000 bbl. The current state-wide figure is approximately 205,000 bbl. greater than the U. S. Bureau of Mines estimate of March demand. The Texas commission disregarded the bureau's recommendations this month on grounds actual demand was greater.

The changed policy of the commission in not adhering to the Bureau of Mines recommendations, and the large number of higher allowable requests granted so far this month are expected to occupy much of the discussion at the state-wide proration hearing at Austin on March 21. Commissioner Sadler has stated that he would recommend reducing production in April on the grounds that current allowables were far in excess of demand. He estimates that a firm demand exists for approximately 1,408,000 bbl. of Texas oil. Commissioner Thompson, on the other hand, stated that he would vote for a cutback in April only upon a showing of evidence that too much crude was being produced. Mr. Thompson previously had voiced an opinion that 15,000,000 bbl. of additional crude would not be injurious to the industry, and there seemed to be a strong demand for all crude being produced.

A THOROUGH INVESTIGATION of all circumstances surrounding the arrest at Midland of an employe of the Railroad Commission on charges of soliciting and accepting a $5,000 bribe was pledged last week by the three members of the commission and Atty. Gen. Gerald Mann. Commissioner Jerry Sadler further stated that an earlier investigation showed the clearance of 700,000 bbl. of excess oil from the district (8) in 1936, 1937 and 1938, and that potentials of wells in all fields where producing capacity is used as a factor in determining the individual well allowables would be retaken by commission engineers.

George Bigham, deputy supervisor of the Midland district for the past year, was arrested as he came out of the Shasta Oil Co. office in Midland. The company had previously notified the attorney general's department that it had been approached with the request that unless $5,000 was paid its allowable would be cut 400 bbl. in West Texas. The money had been marked and the serial numbers taken.

Mr. Bigham, who was discharged by the commission after his arrest, has been temporarily replaced by W. J. Christian, chief proration officer of the East Texas office. H. C. Stipp, who was discharged recently after serving as division engineer for several years, was reinstated and will have charge of making the potential tests. In addition to Mr. Stipp and L. E. Hightower, also attached to the Midland office, three other engineers have temporarily been shifted to the district to assist in making the tests. On Friday, Commissioner Jerry Sadler announced that Morgan Gist, engineer in the Midland office for the past 4 years, had been discharged.

JOHN E. TAYLOR, director of the Texas Railroad Commission's Oil and Gas Division, has been doing a lot of simple things that needed doing, and the results have made the oil man's task much easier in following state regulation. He found a divided administrative authority. His official title is "chief supervisor." Prior to his administration the chief supervisor was nominal head of the entire Oil and Gas Division; but in fact had offices in a different building and divided authority with the chief engineer. Part of the commission records were in the engineering headquarters; the remainder were scattered over several state buildings; and the chief supervisor held the reins of this sprawling organization with a loose hand.

His first job, therefore, was to coordinate the division. He moved his office and all his records to the engineering headquarters; pulled under the same roof the purchasing and auditing divisions—the auditing of production statistics had been roofed with the commission's Gas Utilities Division; and then set about coordinating the work of all these employes.

JOHN E. TAYLOR is a native of Rusk County—now one of the counties in the world's largest oil field, East Texas—and grew up in adjacent Harrison County, hence has a first-hand knowledge of oil-field problems. He is a lawyer by profession, having served as county attorney at Marshall and criminal district attorney at Longview in Smith County. Before going to Austin as an appointee of Railroad Commissioner C. A. Sadler, he was in private practice. He is 43

Modernization of records was another big task. The commission keeps records on the progress of every oil well drilled in Texas; but these records have been scattered helter-skelter, one in one file, another in another, without much rhyme or reason. Today nearly any imaginable record is easily available.

Another innovation to make things easier for the oil industry was speeding up the mailing department; latest machines getting ready copies of orders for more than 4,000 operators; mimeographing and mailing schedules showing the individual allowables of the 90,000 wells in Texas.

Mr. Taylor is now engaged in simplifying and modernizing the commission's general rules, covering all phases of operation from getting a permit to drill to operating a treating plant. Several forms recently have been consolidated and simplified to cut down the bookkeeping required of operators; and several rules have been redrawn cutting out surplusages and simplifying compliance.

OKLAHOMA

THE OKLAHOMA CORPORATION COMMISSION has set Thursday, March 28, for a hearing to establish Oklahoma's oil allowable for April. The Bureau of Mines' estimate of Oklahoma market demand for April had not yet been made, but the state has followed its figures in establishing allowables for the last 7 months.

CALIFORNIA

L. L. AUBERT'S PAPER presented at the Pacific Coast district, Division of Production, American Petroleum Institute, meeting revealed that present indications point to the probability that there will be no upward revision in the state's crude-oil allowable during the remainder of 1940 and if the existing method of curtailment is employed the top-well allotment for the month of December would be down to around 135 bbl. daily. It is the general feeling that too much stress is being placed on depth of production and not enough on the potential of new and existing wells. This revives the question again as to what should constitute an equitable method of curtailment. Operators having large prolific wells feel that potential should be the determining factor and those having deep wells feel that depth should be a vital factor in the determination of allowable production. The difficulty confronting the Central Committee of California Oil Producers is that there is not enough leeway between top wells and intermediate wells. This has been intensified by consistent completions of large wells that makes it necessary for the committee to consistently reduce the maximum top-well allowable.

MICHIGAN

MICHIGAN'S SUPREME COURT ruled last week that mineral rights remain with the previous owner when railroads purchase rights-of-way. Holding that only surface rights are thus acquired, the court affirmed a Gladwin County Circuit Court decision in a dispute in which Michigan Central Railroad Co. sued concerning oil rights in the Buckeye field. Defendants included Garfield Petroleum Co., Michigan Producers & Refiners, Inc., Michigan Oil Co., Inc., John G. Shaffer, Alice Carpenter, Harold H. Thick, Sadie Thick and others. The court divided, five to three, on the opinion.

ARKANSAS

ARKANSAS OIL AND GAS COMMISSION will hold a hearing in El Dorado on March 22 to consider several important field matters. A report on Dorcheat, where gas-condensate production is believed to exist, will be made. The tentative rules for Arkansas' new prospective field near Fouke, Miller County, will be formulated and a gas allowable for the Big Creek field, from which gas may be taken for use in secondary-recovery methods at Buckner, will be set.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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Via Back Door

The threat to producers of crude oil and natural gas in the case now pending before the Federal Power Commission is another indication of the back-door danger to private operation and to state regulatory bodies that lies in authority delegated to federal commissions.

Powers delegated to a commission often are stated in general terms in the act. Then, when the commission finds itself unable to accomplish what it would like to do, it seeks to attain its end by arbitrary interpretations. Often the action has been approved by the courts, or allowed to become effective because those affected fear to antagonize a powerful federal body.

In this case the Federal Power Commission under the Natural-Gas Act is seeking to regulate the price paid for natural gas to a producing company in Kentucky. It is claimed that because the gas is resold by the buyer and eventually transported in interstate commerce it comes within the jurisdiction of the commission.

It is well known that the sponsors of this act never intended that it should interfere in any way with the production of natural gas by well owners, since the act specifically states that its provisions shall not apply to the production or gathering of natural gas.

It is not necessary to point out in detail the direct effect the upholding of that contention will have on both the natural gas and the petroleum industries.

So far as natural gas is concerned, if this interpretation is legal, the production and sale of natural gas will cease to be a private enterprise.

Thousands of owners of crude-oil wells also produce and sell natural gas as a byproduct of their oil-well operations. If the price at which this gas can be sold is subject to the action of the Federal Power Commission it will have a direct influence upon the price of crude oil because of the operating relation between the two.

It would mean that an operator producing and selling his gas would have to enter into an agreement with the buyer subject to the action of the Federal Power Commission. Presumably, if he could not effect a satisfactory agreement, he would have the choice of shutting in his oil production or blowing the gas into the air, an antithesis of the conservation in which the federal administration purports to be so much interested at this time.

Those who were responsible for the passage of the Lea natural-gas bill certainly had no thought of interfering with the producing operations of natural gas or oil wells, but simply sought to regulate the interstate movement of natural gas, now a major fuel supply over a large section of the country.

While having a direct bearing on the production of casinghead gas from oil wells, the broader significance lies in encroachment by the federal Government on matters previously considered intrastate in character.

Because its products are transported and sold on a national basis there has been the contention that the operations of the oil industry are essentially interstate in nature and therefore subject to federal control.

This, again, goes back to the powers reserved to the states and to the federal Government under the Constitution as so ably explained by the governors of the oil-producing states at the recent Cole committee hearings.

Crude-oil and natural-gas producers should lose no time in making known their opposition to this latest effort to encroach upon their operations.

These usurpations are tolerated too often by the people they affect, either through indifference, or because of some temporary benefits. They become the entering wedge for the exercise of absolute authority and are a warning of the dangers inherent in administration of government by commissions.

Court Grants 60-Day Stay In Texas Injunction Suit

HOUSTON, Tex.—A 60-day stay of its injunction against enforcement of the January 24 oil-proration order affecting allowables for properties of Humble Oil & Refining Co. and Rowan & Nichols Oil Co. in the East Texas field was granted the Texas Railroad Commission in Houston last week by the three-judge court for the western federal district.

Judge Sibley said the court did not want to "beat the Supreme Court" to a decision, and that, as a matter of public concern, it was deemed best to leave the case as it was pending action on the appeal.

It is thought the Supreme Court will decide on the appeal within 60 days, but if it does not, it is possible the stay may be extended. The decision which granted the injunction was made by the three judges in Austin on February 21.

At the time of the decision, the court did not enter an order immediately, but granted the Railroad Commission 10 days in which to decide whether it would appeal the case to the Supreme Court or write a new order. The majority of the commission members decided to make an appeal.

The case was argued for the Railroad Commission by James V. Hart, chief of the Oil and Gas Division of the attorney general's department in Austin. He was accompanied by Dr. F. L. V. Patten, director of production for the Railroad Commission, and by Railroad Commissioner Jerry Sadler.

The case for the Humble company was argued by Rex G. Baker of Houston and R. E. Hardwicke of Fort Worth. Other Humble attorneys present were Felix Raymer and Carl Illig, Jr., of Houston.

Rowan & Nichols Oil Co. was represented by former Gov. Dan Moody of Austin and Rice Tilley of Fort Worth.

It was explained by attorneys for the companies that the cases of the two companies were separate, but had been heard by the same court, and that in general the principle affecting the one affected the other, and an order affecting the properties of one of the companies would affect the properties of the other in a similar manner.

In arguing against the stay, Mr. Baker said in general all the Humble company wanted was a proration order, which would prevent physical waste of properties, but at the same time prevent an unusual or unfair drainage from under the properties of any particular owner.

Attorneys for the companies said if the court would allow them to produce increased allowables during the stay term, and if the Supreme Court upheld the commission order, their companies would be willing for the excess oil so produced to be charged against their properties over a reasonable period of time.

Mr. Hart objected to this proposal on the grounds that if such permission was granted "it would do the very harm which the Railroad Commission is seeking to prevent"—that is upset production schedules, create waste, etc.

"Everyone would rush in and want to get their allowables increased," Mr. Hart said.

"To say nothing of an avalanche of injunctions," Judge Sibley observed.

Commissioner Sadler said he was delighted by the decision and Commissioner Thompson said it had "postponed chaos."

Two Pools Opened This Week in Coastal Louisiana Parishes

HOUSTON, Tex., Mar. 19.—Two oil fields were being opened Monday in coastal Louisiana and two other wildcats had cemented casing for production tests. Tide Water Associated Oil Co.'s No. 1 Delta Farms, Bay Brussel prospect, La Fourche Parish, flowed 242 bbl. of 32-gravity oil in 12 hours through various chokes from perforated casing at 11,290-11,305 ft. In Iberia Parish, Plymouth Oil Co.'s No. 1 McHugh, Bayou Pigeon prospect, perforated casing at 8,052-72 ft., and is flowing an estimated 8 bbl. of oil per hour while cleaning out through ⅛-in. choke.

In the Merryville area, Beauregard Parish, Atlantic Refining Co.'s No. 1 Whitmer is bottomed at 8,617 ft., and casing was cemented to test the Sparta-Wilcox series at 8,366-78 ft.

On the Texas coast, Strake Petroleum Co.'s No. 1 Poole, Lissie area, Wharton County, is running casing to test shows of oil and gas logged in the Wilcox below 9,960 ft. Total depth of the hole is 10,116 ft.

Tanker-Rate Investigation Is Reported Being Considered

WASHINGTON, D. C.—Congressional investigation of the increases in oil-tanker rates from Gulf ports to the eastern seaboard, which have resulted in a rapid advance in prices of fuel oil and other similar petroleum products, is under consideration.

Several requests for the inquiry have been received by the Temporary National Economic Committee, as well as by the Cole committee. The T.N.E.C. has been watching price increases in fuel oil in connection with its study of unwarranted price changes, requested by President Roosevelt.

Chairman Cole said that while his committee had not considered price rises as a group, individual committee members have been extremely interested.

The U. S. Maritime Commission has been conferring with officials of major oil companies and other owners of tankers after protests against rate increases had been received by the commission from members of Congress and from the oil industry.

Chairman E. S. Land reported it was the opinion of the commission that the unusual increases in tanker rates and fuel-oil prices were largely attributable to a shortage of tanker tonnage resulting from outbreak of the war.

The commission is of the opinion that within a short time there will be available additional tanker tonnage and a more efficient convoy service for tankers in transoceanic trade which should result in more nearly normal rates without governmental intervention.

California Antitrust Cases Taken Under Advisement

LOS ANGELES, Calif.—Petitions of 39 major, secondary and independent oil companies for more definite knowledge of the nature of antitrust charges brought against them were taken under advisement by U. S. Judge Paul J. McCormick.

DEATHS

JAMES SINAS BEALS, 79, Emlenton, Pa., died March 12. He spent 65 years in the oil fields of the district and for 40 years was employed by President Oil Co.

DAVID C. JONES, 64, vice president and general manager of the Lunkenheimer Co., Cincinnati, Ohio, died on March 11 after a brief illness. He entered the employ of the company in 1894 and had served as president of the American Supply and Machinery Manufacturers Association.

EMMETT QUEEN, 80, who helped develop many western Pennsylvania oil fields, died in St. Petersburg, Fla., of injuries suffered in a trolley-car accident. He lived for many years in Pittsburgh and was associated with Wes Guffey in the oil business.

SAMUEL P. KENNEDY, of Bradford, Pa., banker and retired oil producer, died suddenly in Hollywood, Fla., on Sunday, March 17. The body was taken to Bradford, where funeral was held. Mr. Kennedy, who formerly was interested in production in Oklahoma, and with his brother, Thomas H. Kennedy, formed the Kennedy Oil Co., a large leaseholder in the Bradford field, disposed of his oil interests for a large sum a few years ago. He was a director and one of the principal stockholders in the Bradford National Bank.

THE MARKETS*

CRUDE OIL: With Illinois hitting a new peak of 455,755 bbl. per day, production in the United States last week averaged 3,889,964 bbl. per day, which breaks the previous American oil-production record by 23,414 bbl. per day. The previous peak was reached in the week ended December 23, 1939, 3,866,550 bbl. per day. In that week Illinois produced only 334,684 bbl. per day, but Texas produced 1,588,091 bbl. or 98,659 bbl. more than it produced last week.

REFINERY: A moderately improved tone characterized the gasoline market in the Mid-Continent area, but it lacked strength in the East and was definitely weak on the Gulf and Pacific coasts. Collapse of natural-gasoline prices followed weeks of inability to move burdensome inventories in Texas. Kerosene and tractor fuels were in brisk demand. Domestic fuels were pointing downward. Some observers believed lubricating oils were near the bottom of their decline.

TANK-WAGON AND POSTED-DEALER: Socony-Vacuum reduced consumer tank-car prices of gasoline throughout its marketing territory save in western New York; also reduced dealer tank-wagon gasoline in Albany and most New England points. Standard Oil Co. (Kentucky) advanced tank-wagon and dealer prices of gasoline in Atlanta and Macon. Continental reduced dealer gasoline prices at several Rocky Mountain points. Atlantic Refining reduced dealer gasoline prices in Philadelphia and Wilmington.

FINANCIAL: Although the oils generally did better than other stocks in a weakened market, new lows for the year were recorded. A few issues scored gains over the preceding week. Average of 30 representative stocks for week ended March 16: High, 26.38; low, 25.52; close, 25.61. Week ended March 9: High, 26.36; low, 25.30; close, 26.04.

*Detailed information in market section.

		Net income	Earned per common share
Midwest Oil Co.	1939	$990,281	$0.99
	1938	931,623	0.93
Texas Pacific Coal & Oil	1939	889,236	1.00
	1938	1,035,599	1.16
Derby Oil & Refining	1939	*21,248	*0.07
	1938	*164,358	*0.91
Navarro Oil Co.	1939	†232,566	†0.66
	1938	†579,947	†1.63
Standard Oil of Kansas	1939	122,814	1.25
	1938	557,831	5.25
Columbia Oil & Gasoline	1939	434,962	*0.07
	1938	1,340,062	0.20
Maracaibo Oil Explor.	1939	11,131	0.03
	1938	*37,824	*0.11
Quaker State Oil Ref.	1939	1,604,694	1.73
	1938	515,116	0.56
North Amer. Oil Cons.	1939	309,466	1.12
	1938	249,355	0.90
Texas Corp.	1939	32,886,807	3.02
	1938	23,139,030	2.13
Total 10 companies	1939	$37,460,709	
	1938	28,146,381	
20 companies previously reported	1939	$72,682,137	
	1938	65,282,937	
Total 30 companies	1939	$110,142,846	
	1938	93,429,318	

*Deficit. †Before income taxes.

Natural-Gas Act Carries Threat Of Oil Control by Washington

By HENRY D. RALPH

WASHINGTON, D. C., Mar. 18.—Federal regulation of the sale of natural gas by well owners and producers is threatened in a test case now pending before the Federal Power Commission.

The case involves interpretation of the scope of the Natural-Gas Act and whether the Federal Power Commission has authority to regulate the price at which local producers sell gas which eventually is resold and transported in interstate commerce. The case is considered of such great importance not only to producers of dry gas but also to oil producers having by-product gas which they must sell, that the Independent Petroleum Association of America and the Mid-Continent Oil and Gas Association have intervened and are filing briefs. These associations feel that if the case is decided in the way recommended by the commission's attorneys it may result in federal control of the oil industry more drastic than that proposed in the Cole oil-control bill.

The Natural-Gas Act gives the Federal Power Commission authority over rates for the transportation of natural gas in interstate commerce and for its resale in interstate commerce, but provides that the act shall not apply to any other transportation or sale, or to the production or gathering of natural gas. This exemption has been relied on by gas producers as exempting them from the act. In the pending case the commission's attorneys contend that when the gas sold by the owner of a well is ultimately transported in interstate commerce the commission has the right to regulate the terms of sale.

The case is that of the Columbian Fuel Corp., formerly the Piney Oil & Gas Co., of Prestonburg, Ky., which produces gas from 138 wells on its properties in eastern Kentucky. Under a contract of long standing the company sells its gas at the terminals of its gathering lines in Kentucky to the Warfield Natural Gas Co., a subsidiary of Columbia Gas & Electric Corp. At the Kentucky state line the Warfield company delivers this and other gas to other subsidiaries of Columbia Gas & Electric Corp. for transportation and sale in interstate commerce, principally in West Virginia, and Maryland. The contract between Columbian and Warfield, which antedated passage of the Natural-Gas Act, provided that the price of gas would be 12 cents per 1,000 cu. ft. to November 1, 1939, and 15 cents thereafter. When the Natural-Gas Act was first put into operation Columbian filed this tariff with the commission, and last fall filed a new tariff quoting the 15-cent rate. On its own motion the commission suspended the rate and ordered an investigation. Hearings were held during December and January at which the Columbian corporation relied chiefly on the contention that the Federal Power Commission has no jurisdiction over its rates since it is not engaged in interstate commerce but only in local production and gathering of natural gas.

The case is now nearly ready for final decision by the commission, and the commission's attorneys have prepared a brief and proposed findings of fact holding that Columbian Fuel Corp. is subject to the Natural-Gas Act, the rates at which it sells gas are subject to review by the Federal Power Commission, and the proposed increase in rates should not be allowed because the company has not proved that the increase is justified.

The brief asserts there is a continuous flow, and a regular, unbroken, and uninterrupted transmission of the gas sold by the company from the wells in Kentucky to destinations in other states, and that the sale of this gas to be transported out of the state is a sale in interstate commerce for resale for ultimate public consumption. The section of the law involved is Section 1 (*b*) of the Natural-Gas Act, which reads:

"The provisions of this act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural-gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas."

In commenting on this language, the commission brief states:

"Despite the clarity of the affirmative language of this section, Columbian nevertheless contends that its sale of gas to Warfield is not within the purview of the act and relies, in support of that contention, upon the negative language of Section 1 (*b*), particularly that providing that the provisions of the act: 'shall not apply . . . to the production or gathering of natural gas.'

"The contention is without substance. That the negative language of Section 1 (*b*) in nowise derogates from or impairs the full force and plenary effect of the affirmative language of the section is entirely removed from the realm of speculation by the reports of the congressional committee in charge of the legislative bill."

The brief then quotes from the reports of the congressional committee which drafted the Natural-Gas Act a number of paragraphs in support of its contention that Congress intended the commission to have jurisdiction over transactions of the type in question. In one of these excerpts the House committee on interstate and foreign commerce pointed out that the law would not cover local gas rates already regulated by state commissions but declared: "However, in the case of sales for resale, or so-called wholesale sales, in interstate commerce (for example, sales by producing companies to distributing companies) the legal situation is different. Such transactions have been considered to be not local in character and, even in the absence of congressional action, not subject to state regulation."

The commission's brief then declares:

"Furthermore, in its contention that its sale of gas to Warfield is not within the purview of the act by reason of the negative language of Section 1 (*b*), Columbian fails to perceive the firmly and clearly established legal distinction between its production and gathering of said gas on the one hand and its sales of such gas in interstate commerce on the other.

"The record clearly discloses that Columbian sells and delivers said gas to Warfield at the termini of Columbian's gathering lines. Thus production and gathering are entirely completed prior to the sale and delivery to Warfield.

"The Supreme Court has, on several occasions, emphasized the distinction between the production or manufacture of a commodity and the sale of such commodity in interstate commerce."

A number of Supreme Court cases are quoted to show that interstate commerce begins when production is ended, that the sale of a commodity for movement in interstate commerce is a part of interstate commerce subject to the regulation of Congress, and that the transfer of title at a state line does not remove goods from their interstate character.

The brief also holds that the fact that the contract in this case existed before the law was passed does not remove the rates from the commission's jurisdiction and that since the Columbian corporation did not introduce sufficient evidence as to its cost of production to justify the increased rate the commission must hold that the rate cannot be increased.

The case made out for the commission by its attorneys is one which the oil associations will attempt to rebutt. One point will be that if this precedent is established it will give the Federal Power Commission jurisdiction over the production of gas along with oil, which was not intended by Congress and which will lead to a great many complicating factors outside the scope of the Natural-Gas Act. It is apparent from the language and history of the Natural-Gas Act that Congress was thinking in terms of dry gas, and there are no provisions dealing with the production of gas as a byproduct in the primary production of petroleum. It will be pointed out that in many fields the production of gas along with petroleum cannot be avoided and its rate of production depends in large measure on the rate of oil production. The rate of oil production is fixed

WHAT! ANOTHER?

WASHINGTON, D. C., Mar. 19.—Senator Nye, North Dakota Republican, proposed a Senate investigation to determine whether monopoly exists in the petroleum and natural-gas industry.

He introduced a resolution to direct the Senate judiciary committee to determine whether antitrust laws were being violated in control of production, transportation, sale or distribution of natural gas and petroleum.

by state proration orders and state regulations also prevent the wastage of gas and make it necessary that this gas be captured and sold, the normal market usually being an interstate gas pipeline company. Since the primary product is crude oil, it will be virtually impossible for the average well owner to determine his cost of producing gas in order to justify the rate at which he sells it to an interstate gas company. If every petroleum producer selling gas which ultimately crosses a state line is held to be "a natural-gas company" within the meaning of the law, the producer will have the burden of proving to the satisfaction of the Federal Power Commission that his prices for the sale of gas are reasonable and in line with his investment and cost of production. In the absence of such proof the commission can prevent any increase in the rates and perhaps could order a reduction, and might also require a certificate of public convenience and necessity, based on a showing of need for additional gas, before oil wells could be connected with gas-gathering lines feeding into interstate systems.

In commenting on the contention argued in the commission's brief in this case, Russell B. Brown, general counsel of the Independent Petroleum Association of America, said:

"It would seem from this contention that natural gas may be produced without regulation, but after being produced it cannot be sold, except under the authority of the commission, if it should eventually enter into interstate commerce. Production, however, is for a purpose. It is not an idle purpose. That purpose is the sale of the product. The sale of gas from a well must be free or the production of that gas is not free. Many will feel that such a sale is not interstate commerce. Owners of property have the right to dispose of all or any part of that property if they do not contravene a proper law. To deny the right of sale or to force sales below cost is, in effect, to confiscate property and violate the 'due process' clause under the Constitution.

"Many oil producers also produce gas. It is the lifting force in their wells. This gas is an incidental byproduct of petroleum production. If the production of this incidental byproduct is regulated through restrictions, or its sale under the pretense that it is a public utility, then the production of the primary material—the petroleum—is equally affected.

"If the industry is not permitted to sell its gas except in accordance with regulations of the Federal Power Commission which may determine the price paid for that gas, and after making available its records and books and compiling the innumerable reports which might be demanded, then some producers are likely to believe that to burn the gas in the field or blow it off into the air would be the lesser of two evils."

Foremanship Given Emphasis at A. P. I. Meeting at Wichita

(Continued from Page 26)

The Friday morning session was presided over by T. J. Hamilton, with Herbert Goodpaster, as co-chairman. D. O. Johnson's talk, "Taking the Pulse of a Pumping Well," was followed by a discussion of certain phases of pumping problems. Importance of viscosity, wider spacing and shooting practices in water-flood operations was stressed in "Some Practical Aspects of Water Flooding in Eastern Oklahoma and Kansas," by Lynn C. Converse, Max B. Miller & Co., and R. R. Hawkins, consulting engineer. Operating conditions and practices connected with their own recent water-flooding experience were mentioned by Jack Powell, Brundred Oil Co., and W. S. Walls, Phillips Petroleum Co.

J. M. Gardner, Phillips Petroleum Co., described a method recently devised for the completion of gas wells in the Panhandle area by the rotary method. Max Mahaffey, Cities Service Oil Co., commented on the process. "Search for Oil," by Daniel Silverman, Stanolind Oil & Gas Co., the concluding paper at the morning session, surveyed various types of geophysical methods being used by oil companies in the search for oil. He commented on the magnetometer, gravity meter, torsion balance, soil analysis (vacuum pump, absorbed gas and wax), conductivity, transient electric field, soil resistivity, electric logging, radio activity and refraction and reflection seismograph methods. He concluded by saying that geophysicists are able to map formations to 40,000 ft. in some areas and that millions of dollars are spent each year in drilling shot holes for seismograph operations.

In the paper entitled "Oil Financing," A. W. Kincade, Fourth National Bank, Wichita, Kans., said, "A development which has contributed very largely to qualifying the oil loan is the remarkable progress which has been made in engineering methods for determining underground reserves."

An engineering analysis of cable-tool methods is valuable because there has been practically no literature on the subject, according to a remark made by Eugene A. Stephenson, department of petroleum engineering, University of Kansas, in presenting his paper, "Cable-Tool Drilling Problems," which was based on work done by Kurt Sprengling, DeGolyer & MacNaughton. There was considerable comment on improvements which might be made in cable-tool methods and equipment in the discussion carried on by Herb Ladd, Stanolind Oil & Gas Co., N. M. Hutchinson, Cities Service Oil Co., and W. H. Griffith, Cardwell Manufacturing Co.

J. N. Miles, Cities Service Oil Co., presented a paper entitled, "Recent Developments and Methods of Plugging Off Bottom-Hole Water in the Arbuckle Lime Horizon," which paid particular attention to a method recently developed by his company. Further discussion on the subject was carried on by Fred Shelton, Phillips Petroleum Co., Fred Malonee, Magnolia Petroleum Co., C. F. Seeber, Halliburton Oil Well Cementing Co.

"Keeping Pace With Progress," was the title of a talking moving picture presented by S. F. Greeley, Lone Star Cement Co., which concluded the afternoon program presided over by Herb Ladd, Stanolind Oil & Gas Co.

At a stag party given by Cardwell Manufacturing Co. for those attending the meeting, dinner and entertainment were furnished at the plant where the construction of equipment used in the oil industry was in progress. Other entertainment features of the convention included a special luncheon in honor of Carl A. Young, the annual banquet and a luncheon for the wives of those attending the meeting.

Illinois Production Reaches New Peak of 455,755 Barrels

(Continued from Page 25)

age initial of Devonian wells to date has been 3,437 bbl., but it also is declining.

Practically all of the Devonian properties have been produced at capacity, many operators flowing their wells through both the casing and the tubing. Some are using modified gas lifts for aiding in the production, and some are installing electrically driven centrifugal pumps, while others are installing beam pumps. The race to get the production is due to the high porosity and permeability found in the pay formation which makes it possible for a well to drain a large area. Pore spaces often approach ⅛ in. in diameter. In one case an effort to acidize a well a short distance from another already producing resulted in the opening of channels which connected the wells together, and when last heard of one operator was getting all of the oil. This explains the need for haste in developing the properties and the reason why the wells are produced to capacity.

A high decline, due to the nature of the reservoir and the methods of production, automatically restricts the amount of oil that can be brought to the surface due to the limit on the number of wells that can be completed weekly. Twenty-one Devonian completions per week has been the average in Salem over the past month, and first reports have kept almost abreast of the finished wells. However, completions per week will soon need to be substantially increased if the new wells are to keep up with the decline of wells already completed.

When that point is reached the state's production will decline rapidly until the backlog is reached—the sand wells in the area and the McClosky lime wells which have been operated at restricted rates. Evidence of the condition of the sand wells in the Salem field developed about 2 months ago when some wells which had been restricted were opened wide, the production showing an increase for several weeks and then starting to decline rapidly. The sand horizons in the field could not produce much more than they are at the present time.

Louden Reserves Reduced

The same is true of other fields, including Louden and the central basin fields, both of which have been produced to a large extent at a conservative rate. Any substantial increase in production in these areas would certainly result in a rapid decline after a few weeks. Reserves in the Louden pool were recently reduced on the basis of the production record and a closer analysis of the sand thickness, porosity, and permeability.

Outside of the three fields already mentioned, the state has no potentially prolific fields. Discoveries last year, while numerous, were all small fields. Since January 1, 1940, five fields and one extension have been recorded, the two best being the Irons pool in White County and the unnamed pool discovered by Pure Oil Co. in Section 33-6n-10e, Jasper County. In addition Aux Vases production was recently discovered in the Dundas pool in Richland County, and there is a near-discovery in Section 24-2s-10e, Edwards County.

Wildcatting recently has led to disappointment, several structures being practically condemned when tests were dry. This has caused a little consternation as some operators were confident that the only thing needed to uncover another Salem or Louden was the drilling of a well on some of the better features. An interesting test will be the well to the Trenton lime in the Sandoval field, the field which first recorded Devonian production during the Illinois revival.

The only increase in pile-line outlet to be expected in the near future is the completion of construction on the Sohio Corp.'s 12-in. line to Lima, Ohio, from Stoy, Ill., and the erection of stations from Salem to Stoy. This will add from 35,000 to 50,000 bbl. to the pipe-line capacity of the state. Increases in outlets in the next few weeks will come mainly through the delivery of more oil to Chicago and Toledo, Ohio, for lake shipment, and through the erection of more small refineries in or near the basin.

International

Rumania . .

Belligerent Nations In Hot Competition

PREDICTIONS of intensified warfare during the spring in Central and Western Europe have again focused attention on the petroleum supplies available to Germany and the Allies. Attention is centered on the reserves accessible by the Danube River, which currently represents the only transportation artery upon which Germany can depend because of the British and French blockade.

Rumania is the important question mark for both belligerents. Production from that country has declined gradually but consistently since 1936, reaching a recent low in 1939 of 46,094,000 bbl. Despite the less important position of Rumania as a supplier of petroleum, it is still capable of producing sufficient oil to supplant other outside sources now closed to Germany.

The Reich is making all possible moves to solidify its relationship with Rumania, both commercially and politically, with the obvious view to securing a first mortgage on exportable surplus of petroleum. According to Wirtschaftsdienst (January 19, 1940), the daily newspapers reported recently from Vienna that a German financial group with the cooperation of the Rumanian Banking Institution had acquired 162,000,000 lei of the share capital of the Industria Romana de Petrol S.A.R. and accordingly gained participation in one of the most important of the Rumanian petroleum companies. The I.R.D.P. has a total stated capital of 600,000,000 lei, of which 25 per cent is in French hands. With the help of the German participation, drilling activity is to be intensified during 1940 and the necessary equipment is to be obtained from Germany. (The average value of the Rumanian lei in 1939 was $0.0071).

On December 23, 1939, it was reported that the Petrol Block Co. of Bucharest, within the framework of a capital increase to 470,000,000 lei, had turned over to the Brunn-Konigsfelder Maschinenfabrik shares to the value of 135,000,000 lei as compensation for construction of new refining facilities so that the Brunn-Konigsfelder company is now the leading stockholder of the Petrol Block.

Outside Rumania, other countries in the Balkans and southeastern Europe are today producing petroleum in increasing quantities, as Albania, Hungary, Yugoslavia, Galicia, and the Ostmark (Austria), Greece and Bulgaria are now prospecting for petroleum more intensively.

In Albania, Italy has maintained development in the oil field of Delvino, which can be increased over the 700,000 bbl. annually now being produced. Geological surveying is just beginning and may yet furnish new reserves.

Hungary will be in position to meet most of its internal requirements before 1940 is concluded. Development activity is continuing at an increasing pace in the Lispe field in the southwestern part of the country.

In Yugoslavia, in the so-called Mur Island, not far from the Hungarian field at Lispe, an oil field has been discovered, but its importance cannot yet be estimated. Along with the Murinsel-Petroleum, A.G., which has been in Swiss hands since 1938, the "Rudokop," founded by the First Croatian Savings Bank with a German group, has been active since the beginning of 1939. The company, which at the end of 1939 increased its share capital from 1,000,000 to 25,000,000 dinars and changed its name to "Jugopetrol," has recently negotiated a close cooperation with a neighboring Swiss group. There are accordingly justifiable hopes that in the future this country likewise will be able to meet a part of its requirements.

Greece hopes the Albanian oil fields are continued in the Valley of Kalanas, and is now drilling there intensively. This country plans to drill exploratory wells in Thrace and to develop the asphalt deposits in the Province of Epirus.

The German capital interest in petroleum in southeastern Europe measured by the present production is not large, for the once-important German participation in the Rumanian petroleum industry was completely lost at the end of the first World War. A new way for Reich participation has been opened by the conclusion of the German-Rumanian commercial treaty.

The future prospects for a greater German-Rumanian cooperation are illustrated by the following considerations:

The Rumanian petroleum production, as a result of considerably reduced drilling activity, has declined in the last few years as shown by the following table:

Year—	Production in bbl.
1934	62,438,000
1935	61,773,000
1936	64,188,000
1937	52,709,000
1938	48,366,000
1939	46,094,000

Failure of production to be maintained is explained partly by legal and fiscal hindrances, which are now to be removed or alleviated, according to the report printed in the German publications.

In the view of the Rumanian geologists there are, outside the present known 37,000 acres of prospective oil lands, of which only 16,800 acres are now developed, a further total of 74,000 acres of potential oil land. German receipts of petroleum products from Rumania have increased in the last few years. Since 1938 Germany has stood first among the purchasers of Rumanian petroleum, while in 1937 France headed the list.

Figures for the first 9 months of 1939 show a slight rise in Germany's share of Rumanian shipments. A second development is taking place, involving the movement of larger stocks through the Danube. While Rumanian exports by way of the Danube to Central Europe amounted to 6,325,000 bbl. in 1938, or about 20 per cent of the total, September 1939 shipments alone totaled more than 701,000 bbl. At the September rate of traffic on the Danube, which was interrupted by freezing, the moderate temperatures which are approaching in Europe may permit use of this artery to an even greater extent by Germany during the spring and summer.

Pipe-line facilities exist in Rumania for the potential delivery of 7,400 bbl. of oil daily to the Danube port of Giurgiu, according to a recent review of such facilities by a German petroleum publication. The total length of pipe lines in Rumania is given at 1,740 miles out of which 1,268 miles consist of privately owned gathering systems within the producing fields.

The trunk pipe line from Baicoi, Ploesti, Buzau, Taurei, Fetesti and Cernavoda to Bucharest is 198 miles long and has a daily capacity of 10,300 bbl. The line from Baicoi, Ploesti and Bucharest to the Danube port of Giurgiu, 224 miles long, has a daily capacity of 7,400 bbl. The line from Baicoi to Bucharest, which supplies the local demand of the capital city, has a capacity of approximately 4,400 bbl. daily.

Storage capacity in Rumania is reported to be approximately 18,438,000 bbl., belonging to the state and leased to private companies in accordance with their individual requirements. Petroleum transportation facilities in Rumania are under national control or ownership and this fact alone accounts for conditions under which less than 25 per cent of the country's oil is moved by pipe lines. The remaining 75 to 80 per cent of the petroleum production reaches its destination by rail and this business alone is the most important of the indirect subsidies extended to the Rumanian railroads.

Italy . .

Modernization of Refinery At Milan Is Contemplated

MODERNIZATION of its Fiorenzuola d'Arda refinery has been authorized by Soc. Petroli d'Italia, Milan, according to International Petroleum Trade. The company has arranged to continue its existence to June, 1970. It was created in 1906 with French firms engaged in Central Italy's oil search forming the nucleus of the organization.

Decision to modernize the Fiorenzuola d'Arda refinery is significant in that it represents the first large expenditure in Italy for processing facilities in the interior of the country. During recent years much attention has been directed to improvement of refining facilities along the Italian coast where required imports of petroleum were easily accessible.

No information has been released on details of the construction program. Since, however, it is planned to process imported oil at the interior refinery, it is expected the construction will involve practically a complete plant.

Venezuela . .

Quota Provisions Of Trade Agreement

THE Bureau of Customs at Washington has announced figures for imports of crude petroleum and fuel oil under the quota provisions of the trade agreement with Venezuela, during the period December 16 to 31, 1939, as follows:

Country—	Established quota (gal.)	Imports within tariff-rate quota (gal.)
Venezuela	146,588,007	56,773,649
Netherlands (including its overseas territories)	41,387,156	38,650,762
Colombia	8,155,105	
Other foreign countries	7,747,350	7,747,350

Pipe-Line Activity

Texas-New Mexico Expands System in Eddy County

HOBBS, N. M.—Texas - New Mexico Pipe Line Co. last week completed a 15½-mile 4½ and 5½-in. pipe line from its Artesia system in Eddy County to the Maljamar field in western Lea County. The company also is looping its carrier from the Artesia district by laying a 7-mile 5½-in. loop in eastern Eddy County to increase the line's capacity from 10,000 to 13,000 bbl. daily. The latter project was necessitated largely due to rapid development of the Loco Hills field, to which the company provided a Gulf Coast oulet late last year. In the Maljamar field, which has been served solely by the Murchison-Closeuit Pipe Line Co., the company made term contracts with several independent operators for the purchase of their crude.

Sinclair Second Pipe Line for K.M.A. Field Completed

WICHITA FALLS, Tex.—Construction of Sinclair Refining Co.'s 8-in. pipe line from the K.M.A. field of North Texas to its Hensley station near Jacksboro in Jack County, a distance of 65 miles, was completed late last week, and the line is expected to be placed in operation this week. The carrier, which parallels a 6-in. line laid by the company in the summer of 1939, will also take oil from the Hull-Silk field of Archer County. Due to rapid rate of development in Hull-Silk, the additional capacity can be readily used. Total capacity of the two lines, which tie into the company's Oklahoma - Gulf Coast main line at Hensley, will be 23,000 bbl. daily.

The company also has placed in operation its 7-mile 6-in. line from the new Bonita field in Montague County to a point east of Nocona, where it connects to the Oklahoma - Gulf Coast line running to Fort Worth. This line was laid to provide an outlet for the company's No. 1 Howard, completed this month for an initial potential of 2,116 bbl. in 24 hours. The company now has one offset drilling and a second test staked. Field booster station is of 5,000-bbl. daily capacity.

Southern Natural Gas Co. Plans $3,000,000 New Construction

Southern Natural Gas Co. contemplates expenditure of $3,000,000 for new construction this year, C. P. Rather, president, said in his annual report to stockholders. He outlined plans for extending lines by 44 miles of 8-in. pipe to serve Chattanooga with natural gas through an affiliated distributing company; and the large use of gas by the pipe line's industrial consumers as reasons for the proposed expansion.

Movement of Illinois Oil Eastward at New High

Eastern movement of Illinois crude oil was reflected sharply in the February runs through eastern pipe line of the former Standard group. Crude-oil runs last month hit a new high and were 66 per cent higher than in the same month last year. Deliveries through the eastern group of lines for the first 2 months this year were 52 per cent higher than for the same period in 1939.

The influence of Illinois production on traffic of the eastern lines is particularly in evidence in deliveries through Illinois Pipe Line Co.'s system. In February, Illinois Pipe Line Co. handled 6,450,000 bbl., an increase of almost 100 per cent compared to a year ago. For February deliveries through the nine lines composing the group aggregated 18,097,000 bbl., against 11,213,000 bbl. in February, 1939, and 17,093,000 bbl. in January. The first 2-month deliveries totaled 35,190,000 bbl., against 23,153,000 bbl. in the similar period of 1939.

In the accompanying tabulation is shown deliveries by these nine lines for February and the first 2 months of this year, compared with the similar periods of 1939 (in thousands of barrels):

Lines—	February 1940	February 1939	2 months 1940	2 months 1939
Buckeye	5,328	3,656	10,542	7,640
Eureka	749	435	1,605	795
Illinois	6,450	3,269	12,380	7,337
Indiana	1,625	1,643	2,941	3,275
National Transit	1,419	839	2,729	1,838
New York Transit	518	546	1,020	496
Northern	644	250	1,075	535
Southern	371	57	736	129
Southwest Penna.	993	518	2,162	1,108
Total	18,097	11,213	35,190	23,153
Daily average	624	400	587	392

West Texas Natural-Gas Line Awaits Lambing Time

Surveying for the 45-mile 8-in. natural-gas pipe line which has to be laid by Lone Star Gas Co. from the Page field in Schleicher County to San Angelo, Tex., has been completed and the right-of-way is being acquired. Ditching and moving in of pipe will await the lambing season. Line must be completed January 6, 1941, if fuel contract with West Texas Utilities be fulfilled.

Treasure State Pipe Line Co. Buys Ohio's Half Interest

Purchase of Ohio Oil Co.'s half interest in the Treasure State pipe line, pioneer Kevin-Sunburst gas system which serves the town of Sunburst and the International Refining Co. plant, was announced by E. B. Coolidge, president of Treasure State Pipe Line Co.

LOUISIANA NEVADA LINE OPENED, WITH DUE CEREMONY

Opening the valve which admitted gas from the new Louisiana Nevada Transit Co. line to the large rotary furnace at the plant of Arkansas Portland Cement Co. Five million cubic feet of gas is consumed per day at this plant. Nathan P. O'Neal, owner of Hope Brick Works, Hope, Ark.; holding the wheel are T. R. Jones, general contractor of pipe-line construction, Dallas, Tex., and president of Louisiana Nevada Transit Co.; W. A. Delaney, Jr., independent oil producer of Ada, Okla., chairman of the board of Louisiana Nevada Transit Co.; standing to the right, M. O. Matthews, cement manufacturer of Ada, Okla., and secretary-treasurer of Louisiana Nevada Transit Co.

The initial construction program of the Louisiana Nevada Transit Co. system has been completed with delivery of industrial gas to Arkansas Portland Cement Co., Howard County, Arkansas, and to Hope Brick Works at Hope, Ark. This system will be extended to serve other industries in western Arkansas. Prompt connections for drilling gas will be made to encourage oil exploration and development in this area. It is planned to furnish natural-gas service to the towns of Taylor, Bradley, Fulton, McNab, and Saratoga, Ark.

Natural Gas

Houston Domestic Rates Reduced for First Time

HOUSTON, Tex.—The first gas-rate reduction since natural gas was piped to Houston for domestic consumption 13 years ago was announced last week by Mayor Oscar F. Holcombe. The present domestic rate, in effect since 1926, is 65 cents per 1,000 cu. ft. for all gas consumed regardless of the amount, plus a monthly 50 cents ready-to-serve charge. The 50 cents did not pay for the use of any gas.

Under the new rate the monthly 50 cents ready-to-serve charge will be dropped. Instead there will be a minimum monthly bill of 60 cents which includes the use of the first 400 cu. ft. of gas. For the gas used in excess of the minimum bill, the rate will be 65 cents per 1,000 for the next 5,600 cu. ft., 60 cents per 1,000 for the next 10,000 cu. ft., and 50 cents per 1,000 for all additional gas.

The first 1,000 cu. ft. used will cost only 99 cents under the new rate as compared with $1.15 under the old rate, a reduction of 16 cents or 13.9 per cent. Every bracket of consumption will have a reduction with the percentage of reduction ranging from 3.6 per cent to 21 per cent.

Sixty Days' Notice of Increase In Gas Rates Necessary

In an amendment to its provisional rules of practice and regulations under the Natural-Gas Act, the Federal Power Commission provides that Part 54, Section 54.3 shall be amended as follows:

"(6) If the proposed change is an increase in rates, other than for resale to industrial customers, then 60 days prior to the proposed effective date of the change the additional information shall be submitted."

Refinery Expansion

Socony-Vacuum Leases Site For New Wadhams Plant

MILWAUKEE, Wis.—After negotiating for a 30-year lease with a 10-year renewal option, on 10 acres of Jones Island in the Milwaukee Harbor from the city, Socony-Vacuum Oil Co., Inc., has signed a 20-year lease under which its Milwaukee subsidiary, Wadhams Oil Co., will transfer much of its operation to the site.

R. O. Baumgarten, superintendent of buildings and equipment for Wadhams, said construction will begin in a few weeks. The company plans to spend between $250,000 and $350,000 on improvements, which will include seven large and four small storage tanks with a capacity of more than 8,000,000 gal.

Nathan Lynch Purchases Travis Kilgore Plant

SHREVEPORT, La.—Nathan Lynch, of East Texas, has purchased the 5,000-bbl. refinery of M. M. Travis, Inc., in Kilgore. The plant, formerly operated by Southport Petroleum Co., has a cracking capacity of 3,000 bbl. daily. The Lynch interests are also operating the former Lacy plant in Kilgore under lease until August 1, 1940, and the Gladewater plant of Gladewater Refining Co., formerly Texas Oil Products Co., which lease expires March 31.

Trojan Development Co. Suit Against Indiana Argued

SPRINGFIELD, Ill., Mar. 18.—The federal district courtroom of Judge C. G. Briggle became a demonstration laboratory as Attorney Lynn A. Williams for Standard Oil Co. of Indiana attempted to disprove a patent infringement claim involving the oil-dewaxing process it has been using.

The suit, brought by Trojan Development Co. of Clinton, Iowa, alleged Standard used a hydrocarbon refrigeration method patent in 1919 by Albert G. Crawford, and asked an injunction and an accounting.

Mexico Reported Planning Solvent Refining Unit

Petroleos Mexicanos, the Mexican Government agency created to operate oil properties, is planning the construction of a solvent unit for refining lubricating oils at the Arbol Grande refinery, near Tampico. A report from Mexico City placed the cost of the projected solvent refining addition at 5,000,000 pesos (about $845,000 in U. S. currency at the present rate of 16.9 cents to the peso).

Investigation in New York indicated that no definite commitment had been assumed by American licensing and engineering firms covering the various solvent-refining patents.

To Add Dewaxing Plant to Sinclair Pasadena Refinery

HOUSTON, Tex.—Work is to start this week on a $1,500,000 dewaxing plant at the Sinclair refinery on the Ship Channel at Pasadena. The general contractor is Lummus Co. There will be three buildings, one 65 by 65 ft., one 60 by 120 ft., and a third, 25 by 60 ft.

Great Lakes Carbon Corp. To Build Coke Plant

LOS ANGELES, Calif.—Great Lakes Carbon Corp., New York, has purchased 10 acres at Wilmington for the construction of a petroleum-coke calcining plant. The new plant will represent an investment of more than $500,000 and have a capacity of 100,000 tons yearly. Three silos with a capacity of 40,000 tons of carbon will be built, the largest ever erected, it is declared.

Export shipments will be made from Long Beach Harbor where a 1,000-ft. wharf is being built at an expenditure of $100,000 in dredging and dock construction.

Mechanical loading facilities will be installed with a capacity of handling 350 tons of coke per hour.

Regina Plant Will Resume Its Full Operations

REGINA, Sask.—Rapid progress is being made with replacements and repairs to the Imperial Oil, Ltd., refinery here, recently damaged by fire. It is expected the plant will resume full operations early in April. Substantial quantities of gasoline and other products are in storage, enabling the company to supply normal demands in Saskatchewan and western Manitoba during the shutdown. The plant processes Turner Valley crude exclusively, and the interruption to refining operations necessitated a temporary reduction of 2,500 bbl. a day in the Turner Valley allowable.

Move Refinery From Sibley To Cotton Valley Site

SHREVEPORT, La.—Evansville Oil Corp. of Shreveport is moving its 1,000-bbl. refinery from Sibley, La., to Cotton Valley, where it will charge Bodcaw distillate and D sand crude for manufacture of motor fuel and solvents. Operations are slated to begin in the plant in about 6 weeks.

Find 10,000,000-Cu. Ft. Gas Well in Elmira Quarry

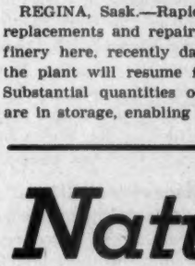
ELMIRA, N. Y.—A natural-gas well in an abandoned stone quarry on the edge of this city brought in a flow which Charles E. Fralich, geologist of Belmont Quadrangle Co., Bradford, Pa., estimated will develop into 10,000,000 cu. ft. daily.

Mr. Fralich said the well, which came in at a 60,000-cu. ft. flow at a 3,000-ft. depth, is the first in Chemung County to produce.

Natural Gasoline

New C.N.G.A. Specific-Gravity Bulletin Based on 2 Years' Study

Following more than 2 years of intensive study, conference and committee work, the California Natural Gasoline Association announces publication of its new bulletin, TS-391, titled, "Tentative Standard Methods for Determining the Specific Gravity of Gases." The announcement was jointly released by W. W. Robinson, Jr., Texas Co., general chairman of the group's technical committee, and W. L. Cowan, Union Oil Co., chairman of the subcommittee in charge of drafting the bulletin.



W. L. Cowan, chairman, national gravity bulletin committee, C.N.G.A.

According to Mr. Cowan, it is well known that the proper determination of specific gravity is of utmost importance in the derivation of current coefficients for orifice meters and the industry has long needed a reliable presentation of the different methods by which this test may be made. In preparing the bulletin the California Natural Gasoline Association states it has spared no expense and the committee no time and effort in bringing together, under a single cover, one of the most complete, exhaustive and accurate statements of specific-gravity tests ever to be published.

The bulletin discusses the limits of application, apparatus, sampling, field and laboratory test procedures and the calculation of results. The various specific-gravity methods discussed are (1) Edward's balance; (2) the Ac-Me suspension balance; (3) Anubis balance; (4) globe weighing; (5) gas analysis; (6) effusion method; and (7) the determining of specific gravity by indicating and recording gravitometers. The apparatus for carrying out each of the tests is described and the description is fully supplemented with notes on calibration. The effect of water vapor on the determination of specific gravity is also covered and comments are given on the application of temperature corrections, the use of mercury columns and purification of air.

Members of the committee which prepared the bulletin are W. L. Cowan, Union Oil Co., chairman; P. E. Beckman, Pacific Gas & Electric Co.; Art Bennett, Ketteman North Dome Association; Frank J. Colton, Tide Water Associated Oil Co.; W. C. Dayhuff and R. N. Donaldson, Standard Oil Co. of California; George H. Forster, Texas Co.; C. B. Heartwell, Standard Oil Co. of California; P. W. Hill, Foxboro Meter Co.; C. L. Hutchings, Tide Water Associated Oil Co.; Mark McIlvaine, Chanslor-Canfield-Midway Oil Co.; L. C. Miller, Signal Oil & Gas Co.; G. B. Reece, Southern Counties Gas Co.; J. A. Smith, Texas Co.; E. P. Valby, Richfield Oil Corp., and B. G. Williams, Southern California Gas Co.

Recycling Operations in Grapeland Gas Field Being Increased

FORT WORTH, Tex.—Gas-recycling operations in the Grapeland field of Houston County, East Texas, within the next few months will be greatly increased when construction work now under way, or planned, is completed. One large recycling plant is now under construction, preparations for a third plant are under way and capacity of the field's first plant is expected to be soon doubled in volume.

Construction of Lone Star Gas Co. and Trinity Gas Co. plant was started early this month on their 80-acre tract in the Caleb Wallace Survey. This plant will have a daily capacity of about 50,000,000 cu. ft. with compression equipment totaling 1,875 hp. Contract for the work was let to Gasoline Plant Construction Co. of Houston, Tex.

North of the town of Grapeland, on its John Ellisor tract in the J. Herod Survey, Grapeland Oil Co. of Abilene, Tex., is making preparations for the construction of the field's third plant. Capacity of this plant will be about 35,000,000 cu. ft. of gas daily. Contract for its construction has been let to Zachry Construction Co. of San Antonio, Tex.

American Liberty Oil Co. of Dallas, Tex., operator of the field's present plant, is expected to double the capacity of its plant in the near future. Present capacity of this plant is about 10,000,000 cu. ft. daily.

Carter Oil Company Installs Copper Treater at St. Elmo

Carter Oil Co. has installed a 20,000-gal.-per-day copper sweetening unit in the recently completed Taylor gasoline plant near St. Elmo, Ill. This unit was installed under license from Perco, Inc., of Bartlesville, Okla.

Service on Active Fields

BORNHOLDT POOL, McPHERSON AND RICE COUNTIES, KANSAS

Compiled by The Oil and Gas Journal

Approved name

Bornholdt.

Geographic location

Southwestern McPherson County, southeastern Rice County, Central Kansas. Major portion of proven area in McPherson County.

Principal cities and towns

Hutchinson, population 27,700, due south; McPherson, population 6,147, northeast, and Lyons, population 2,939, northwest, are about equidistant from the field, approximately 15 miles. Newton, population 11,200, is about 36 miles southeast of the field, and Wichita is 25 miles south of Newton.

Highways and roads

U. S. Highway 81 from Wichita to McPherson, state Highway 96 from Wichita to Hutchinson and on to Lyons, and U. S. Highway 50 from McPherson to Lyons are paved. State Highway 17 from McPherson to Hutchinson, through Inman, about 6 miles southeast of field, also paved. Country roads, graded and generally hard-surfaced or in all-weather condition, traverse the field east-west and north-south, connect with the principal highways.

Railroad servicing area

Windom, 6 to 8 miles due north, on Santa Fe from McPherson to Lyons, is a principal shipping point. Other nearby railroad stations on Rock Island, running from Hutchinson to McPherson, and on Frisco, running northwestward from Wichita through Medora and Matheson, to Lyons.

Type country

Plains, generally flat, slightly rolling in spots. Vegetation, trees sparse. Much of the land in vicinity of the field cultivated, with wheat as a principal crop. Little Arkansas River traverses the area from northwest to southeast.

Availability to supply houses

Numerous supply houses at Hutchinson and McPherson.

Trucking and hauling facilities

Teaming and hauling contractors available in the field, with prompt and adequate service available from Hutchinson and McPherson. Some of the operators provide own facilities.

Electric power and gas companies

Electric power obtained from high line of McPherson Gas & Electric Co., traversing field. Some natural gas from companies' own wells used for drilling; butane used on some wells.

Hotel and other accommodations

Excellent hotel accommodations available at Hutchinson, McPherson, Lyons, within a few minutes' drive from the field over good roads. Rooming houses and restaurants are in smaller, nearby towns.

Pipe lines

Continental Pipe Line Co.'s line from Rice County fields serves the Bornholdt area. A Sinclair Prairie line has connected with Westgate-Greenland Oil Co. and others' No. 1 Hodge, Section 25-20-6w, Rice County sector of the field.

NUMBER OF DRILLING AND PRODUCING WELLS, BY COMPANIES, AS OF MARCH 11, 1940

Operator—	Producing	Drilling
Bradley Brothers & Blair	4	3
E. K. Carey	1	0
H. C. Bennett and others	2	0
Central Petroleum Co. and others	1	1
Continental Oil Co. and others	9	3
Hartman and others	0	1
Mid-Continent Petroleum Corp.	1	1
W. C. McBride, Inc.	1	0
Ohio Oil Co.	1	0
Republic Natural Gas Co.	1	1
Sunray Oil Co. and others	4	2
Transwestern Oil Co.	0	1
Westgate-Greenland and others	2	1
Total	27	14

Lease ownership

Leaseholders include Bradley Brothers, Tulsa Oil Corp., Sunray Oil Co., Fain Drilling Co., Continental Oil Co., Mid-Continent Petroleum Corp., Ohio Oil Co., W. C. McBride, Inc., Earl Carey of McPherson, Henry Bennett of Augusta, C. R. Craft of Wichita, Westgate-Greenland Oil Co., Central Petroleum Co., Springrose Drilling Co., Republic Natural Gas Co., Cities Service Oil Co., Transwestern Oil Co., Phillips Petroleum Co., and others.

Development prior to discovery

The Welch field, about 1⅛ miles southwest of Bornholdt, is the oldest pool in Rice County, second oldest in western Kansas, and one of the more prolific chat oil-producing areas in the state. It was discovered in April 1924 and was the first pool to show commercial production from chat. The North Welch pool is separated from the main pool by about 1 mile, and is about 1⅛ miles northwest of the Hodge sector of Bornholdt. More than 40 wells were drilled in the Welch pools, and some 30 still are producing. Total production has passed 4,000,000 bbl.

Discovery well

The Bornholdt pool, quite isolated from other McPherson County areas, a 1937 discovery, remained a one-well pool through 1938. Bradley Brothers and B. B. Blair took a farmout from Continental Oil Co. and contracted with C. R. Craft to drill the discovery well, No. 1 Bornholdt, Section 30-20-5w. It made potential of 131 bbl. of oil daily from chat at total depth of 3,335 ft.

Development subsequent to discovery well

About 2 years after completion of the discovery well, Bradley Brothers and associates and Continental Oil Co. communitized their holdings in NE¼ Section 36-20-6w and NW¼ Section 31-20-5w, and drilled No. 1 Mattson ½ mile southwest of the discovery. It came in flowing 773 bbl. of oil through 7-in. casing for 24-hour potential. That started a development program that has resulted in extension of the pool in every direction and across the line into Rice County. The Hodge pool was opened in Rice County and later joined to Bornholdt when intermediate producers were completed. North Bornholdt pool recently was opened in McPherson County and expectations were it would be joined with the main pool eventually. Several farmout deals were made, Sunray Oil Co. and Fain Drilling Co. obtained acreage and began a consistent development program, and other operators with leases in the area also became active. Continental Oil Co. completed a well in Section 31-20-5w, which made daily potential of 3,033 bbl. of oil on physical test, flowing through 3-in. tubing.

It was the largest producer in the field until recent completion of Sunray Oil Co.'s No. 4 Biggs, NE NW NW Section 29-20-5w. In the Biggs well chat was topped at 3,362 ft. and formation was penetrated to 3,373 ft., total depth, pipe being set on top of pay. It came in naturally, flowing at the rate of 100 bbl. an hour while drilling in with cable tools. For completion, 2½-in. tubing was run, it was put on beam with rods and by drawdown method made potential of 28,775 bbl., with maximum allowable potential of 3,000 bbl.

In the fall of 1939, Bradley Brothers took a 1,280-acre block north of the proven field and made a deal with Central Petroleum Co. and Springrose Drilling Co. to drill No. 1 Swanson, C N½ NW NW Section 18-20-5w. It found chat on a level with the formation top in the W. C. McBride well, 2⅛ miles southward, which had connected the Bornholdt and Hodge pools. Drilled 47 ft. into chat, the Swanson well flowed 150 bbl. of oil an hour to open North Bornholdt.

Limits of the Bornholdt area are yet to be determined.

Geological information

Production is from chat, an erosional detritus found at the top of Mississippi lime. Since that material largely is made up of chert fragments, drillers called it chat and that name became the common term for the formation. Bornholdt pool is a stratigraphic trap, rather than a structural feature. It is east of the pinchout of the

Mississippi lime, which pinches out on the southeast extremity of the Barton arch. Some observers believe the Bornholdt and Welch pools may be drawing from a common source.

Ultimate recovery

It is estimated the producing area will extend over approximately 3,000 acres, with ultimate recovery estimated at 10,000 to 12,000 bbl. an acre.

DRILLING CONDITIONS

Drilling water

Fresh water in abundance is obtained from wells averaging 60 ft.

How wells are drilled

The discovery well was drilled with standard tools. Ohio Oil Co. drilled one slim-hole test. Some of the operators drill their own wells, others are drilled on contract.

Type drilling equipment

All power rigs, no steam. With exception of discovery well, all wells drilled with rotary.

Derricks

Ninety-four-foot steel derricks, with 24-ft. base.

Drilling mud

Weight of mud averages 10 to 11 lb. No artificial mud.

Casing program

Surface casing, 10¾-in. pipe, is set at 100 to 160 ft. Open hole is drilled from surface casing to top of chat. Some operators core for top of pay, others determine it from samples and by circulating. Continental Oil Co. runs 6-in. pipe to top of chat; Sunray Oil Co. and some other operators use 7-in., and Bradley Brothers, Blair and one or two others set 5½-in. casing on top of the chat. After cementing pipe on top of casing, wells are drilled with cable tools.

Drill-stem and electrical logging

Field conditions have not required drill-stem tests or electrical logging. Red shale is on top of chat. At its base, shale is mixed with chat and is of the consistency of butter. In the early development, some operators would mistake this shale-chat mixture for top of chat and would run casing. Then they would find more shale below pipe, resulting in bad cleanup jobs, run liners or use squeeze jobs. Sunray Oil Co. cores to top of chat. It is difficult to recover chat in a core, but they can tell when top of the pay is reached.

Gas hazards and blowouts

There have been no blowouts. There is a low gas-oil ratio and gas cannot be depended upon.

Average drilling time

Drilling time averages 8 to 12 days.

PRODUCTION PRACTICE

Method of producing wells

Some wells flow naturally, others require pumping equipment immediately on completion. Wells are tubed with 2½-in. or 3-in.

Spacing program

The field is being developed on a pattern of one well to 20 acres.

Proration restriction

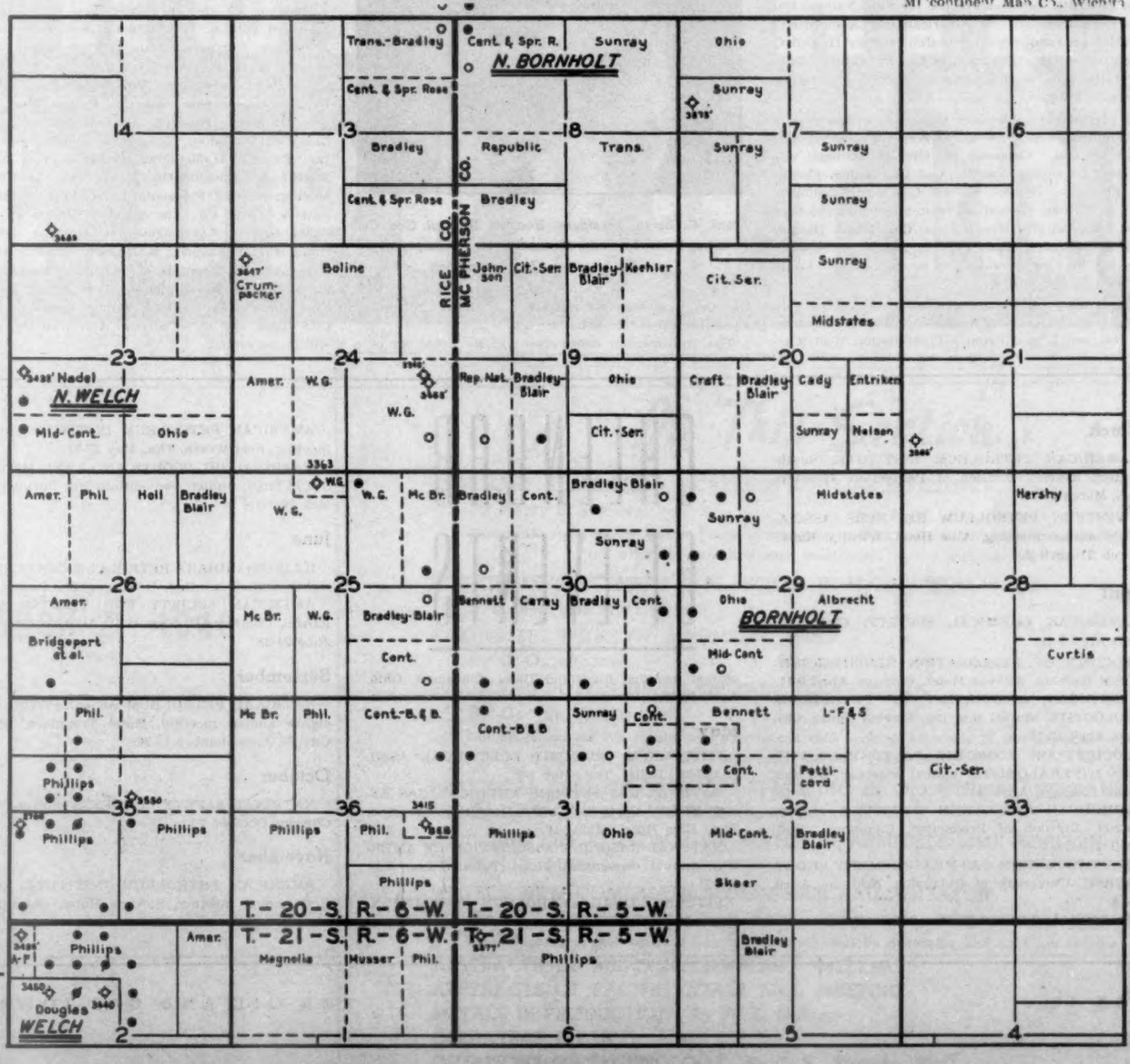
Bornholdt wells have daily allowable production of 70 bbl.

Water conditions

Salt water has not yet come in to plague Bornholdt operators to any extent, no wells making an appreciable amount of water.

Bornholdt pool, McPherson and Rice counties, Kansas

Mi'continent Map Co., Wichita



PROGRAMS AND MEETINGS

Practical Program Planned For Natural Gas Meeting

When the thirty-fifth annual Natural Gas Convention meets May 6 to 10, it will be the first time it has met in Houston, Tex. It will also be the first combined meeting with the American Gas Association's distribution conference which is holding its seventeenth annual meeting.

The Natural Gas Convention program has been designed along practical lines to cover all phases of the industry. Many of the papers are the result of years of research.

Research is the background for an important address at the general session on May 7. Herbert E. Graham, director of metallurgy and research for Jones & Laughlin Steel Corp., Pittsburgh, Pa., will speak on the "Contribution to the Natural Gas Industry by Research in the Steel Industry." Mr. Graham is chairman of the executive committee of the Industrial Research Institute, member of the American Society for Testing Materials, American Society for Metals, American Institute of Mining and Metallurgical Engineers and others, including institutes in several foreign countries.

Research will also be the basis for an address by Frank C. Smith, president of the Houston Natural Gas Co., and chairman of the American Gas Association's committee on fundamental research; and by Howell C. Cooper, of the Hope Natural Gas Co., Pittsburgh, chairman of the Natural Gas Section's main technical and research committee.

The production conference this year will feature a symposium on "Our Experiences With the Underground Storage of Gas," discussed by Carl U. Daniels, vice president, Oklahoma Natural Gas Co., Tulsa; Fenton Finn, geologist, Peoples Natural Gas Co., Pittsburgh; Porter D. Mellon, general superintendent and chief engineer, Canadian Western Natural Gas, Light, Heat & Power Co., Calgary, Alta., Canada, and J. H. Newlon, geologist and superintendent of production for Equitable Gas Co., Pittsburgh.

Coupled with this will be a paper by S. A. Chadwell, of Ohio Fuel Gas Co., on "A Study of Mixtures of Separator Gas and Liquid From a Combination Well, Cayuga, Texas." The second session of the production conference will feature a symposium on "Drilling Beyond the First Mile," by C. E. Reistle, Humble Oil & Refining Co., Houston; H. P. George, Southern California Gas Co., Los Angeles, and H. A. Wallace, Jr., United Fuel Gas Co., Charleston, W. Va.

Frank C. Smith, president, Houston Natural Gas Co., Houston, Tex., chairman, Committee on Fundamental Research, American Gas Association

The transmission conference will be made up of a group of unusually up-to-the-minute papers on advanced phases of pipe-line construction and operation among which are:

"Radio Communication for Dispatching and During Emergencies," by W. T. Bulla, superintendent of telephone and pressure, Natural Gas Pipe Line Co. of America, Chicago.

"Use of the 'Go-Devil' for Improving the Flow Efficiencies of Natural-Gas Pipe Lines," by C. H. M. Burnham, chief engineer, Panhandle Eastern Pipe Line Co., Kansas City, Mo.

An interesting paper dealing with gas engines and compressor operation will be delivered by B. L. Rogers and O. H. Moore, of Lone Star Gas Co., Dallas, Tex., on "Four-Point Control in the Operation of the Four-Cycle Natural-Gas Engine."

Construction and operating features of major pipe lines will be handled by H. J. Carson, vice president of Northern Natural Gas Co., Omaha, Neb., whose subject is "Large Welded Pipe Lines."

Many new uses have been found for natural gas in industrial plants during the past few years and H. O. Loebell will present a paper on "Improvements in Industrial Processes Through Advancement in Heat Application."

The Rice Hotel will be headquarters for the convention.

Hightower Heads Committee On Fire Prevention

C. L. Hightower, United Gas Pipe Line Co., Houston, Tex., has been appointed chairman of the 1940 committee on fire prevention of the American Petroleum Institute's Division of Production.

Members of the committee are: M. B. Anfenger, Standard Oil Co. of California, San Francisco; P. R. Applegate, Northern Group of Pipe Lines, New York; Donald A. Bering, Shell Oil Co., Inc., San Francisco; H. W. Boggess, Sinclair Prairie Oil Co., Tulsa; A. W. Breeland, Lone Star Gas Co., Dallas; Paul Hubbard, Gulf Oil Corp., Houston; W. C. Kinsolving, Sun Pipe Line Co., Beaumont, Tex.; R. J. Lauder, Shell Oil Co., Inc., Tulsa; J. D. McCamey, Carter Oil Co., Tulsa; T. S. Maffitt, Jr., Houston Oil Co. of Texas, Houston; B. A. Moeller, General Petroleum Corp., Vernon, Calif.; A. S. Patrick, Texas Co., Los Angeles; George F. Prussing, Union Oil Co., Los Angeles; H. C. Renz, Atlantic Refining Co., Dallas; R. B. Roaper, Humble Oil & Refining Co., Houston; H. J. Wilson, Tide Water Associated Oil Co., San Francisco; J. H. Wood, Jr., Atlantic Pipe Line Co., Dallas; L. K. Worth, Stanolind Oil & Gas Co., Tulsa, and D. V. Stroop, American Petroleum Institute, secretary.

CALENDAR OF EVENTS

March

AMERICAN PETROLEUM INSTITUTE, Southwestern district, Division of Production, Houston, Tex., March 28-29.

WESTERN PETROLEUM REFINERS ASSCIATION, annual meeting, Allis Hotel, Wichita, Kans., March 31-April 2.

April

AMERICAN CHEMICAL SOCIETY, Cincinnati, Ohio, April 8-12.

SOCIETY OF EXPLORATION GEOPHYSICISTS annual meeting, Stevens Hotel, Chicago, April 9-11.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, annual meeting, Stevens Hotel, Chicago, April 10-12.

SOCIETY OF ECONOMIC PALEONTOLOGISTS AND MINERALOGISTS, annual meeting, Stevens Hotel, Chicago, April 11.

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, Columbus, Ohio, April 11-12.

SOUTHWESTERN GAS-MEASUREMENT SHORT COURSE, University of Oklahoma, Norman, April 16-18.

NATIONAL PETROLEUM ASSOCIATION, semi-annual meeting, Cleveland Hotel, Cleveland, Ohio, April 18-19.

May

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Dallas, Tex., May 1-3.

NATURAL GAS SECTION, AMERICAN GAS ASSOCIATION, thirty-fifth annual meeting, Houston, Tex., Rice Hotel, May 6-10.

NATURAL GASOLINE ASSOCIATION OF AMERICA, annual convention, Hotel Tulsa, Tulsa, May 15-17.

INTERNATIONAL PETROLEUM EXPOSITION, Tulsa, May 18-25.

AMERICAN PETROLEUM INSTITUTE, midyear meeting, Fort Worth, Tex., May 27-31.

NATIONAL OIL SCOUTS AND LAND MEN'S ASSOCIATION, annual convention, Hot Springs, Ark., May 30-June 1.

June

ILLINOIS-INDIANA PETROLEUM CONFERENCE, eighth annual meeting, Robinson, Ill., June 1.

AMERICAN SOCIETY FOR TESTING MATERIALS, Chalfonte-Haddon Hall, Atlantic City, N. J., June 24-28.

September

NATIONAL PETROLEUM ASSOCIATION, thirty-eighth annual meeting, Hotel Traymore, Atlantic City, N. J., September 18-20.

October

NATIONAL SAFETY CONGRESS, Stevens Hotel, Chicago, October 7-11.

November

AMERICAN PETROLEUM INSTITUTE, twenty-first annual meeting, Stevens Hotel, Chicago, November 11-15.

Development of the Devonian lime in the Salem, Ill., field requires special cementing of the casing due to a porous formation several hundred feet off bottom. From 300 to 500 sacks of cement are pumped through the bottom of the casing and then the second batch of 300 to 700 sacks is placed through a cementing collar located just above the porous streak. Sometimes a stage-cementing job is required before a shutoff can be obtained, thus assuring the operator that the casing is adequately protected by cement

ENGINEERING & OPERATING

MARCH 21, 1940

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PERFECT NEW COMBINATION DEGASSER AND AGITATOR
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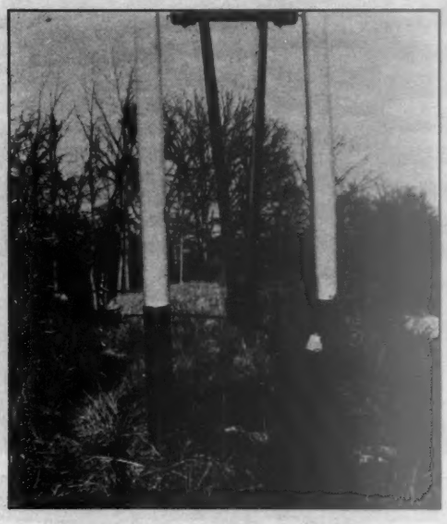
Right: Takeoff for pumping water well at power is attached to one end of the rod line leading to a jack; pumping jack over water well at extreme right. Below: Pendulum swing supports the rod line at each end of the catenary. The sag at this installation is nearly 11 ft.



A trench modifies the contour of the ground and allows rod-line suspension to approach a true catenary curve

Catenary Suspension Increases Rod-Line Efficiency ... on Pumping Powers

By HARRY F. SIMONS

MORE extensive use of dynamometers for testing pull-rod-line efficiency has led to re-examination of the friction losses between the centrally located geared power and the pumping jack and the remodeling of the pull-rod line to reduce horsepower requirements. For years it has been known that the catenary suspension of pull-rod lines traversing rough terrain was more efficient than trying to establish straight pull; this was evidenced by an increase in the number of wells which could be pumped by a geared or band-wheel power with pull rods suspended in this manner over the number of wells which could be pulled when using straight rod lines. Theoretically, the catenary suspension was more efficient but there was no quantitative measure of the saving.

Pure Oil Co., with approximately 600 wells which average 3,000 ft. in depth in the Illinois basin, and nearly all of which are located favorably for pumping with a central geared power, has been giving the problem of rod-line design considerable attention. From past experience in pumping by the power method, particularly in the Van, Texas, field, they have designed all of their rod lines to take advantage of the catenary principle with a resultant reduction in the cost of prime-mover installations.

Engineers and production superintendents of Pure Oil Co. are also experimenting with a new type rod-line carrier with which to further reduce the friction losses; at the present time they have one geared power equipped with the new carriers pumping 31 wells, some of which have rod lines approximately a mile long. (The Oil and Gas Journal, Oct. 26, 1939, Page 126). Normally the number of wells pumping from a single geared power is seldom over 20.

Use of geared powers and a single prime mover for the pumping of 20 to 30 wells effects an important reduction in the lifting costs per well. Principal items in addition to well equipment are the geared power, prime mover and pull rods. As a reduction in the friction losses will make it possible to use smaller engines and smaller pull rods and give added life to the geared power, the elimination of small losses becomes important.

The greatest power losses are due to the friction between the pull-rod lines and the doll heads which support them. The doll heads set on top of 2-in. pipes driven into the ground; they are made from hardwood and are greased to reduce the friction. Power loss due to the sliding of the rod over the doll head will vary during a 24-hour period due to the thickening and thinning of the

Rod-line carriers which approach total elimination of friction have been tested on one power and are being installed on others

lubricant, and a plant operating near its peak load during the day time will have to reduce its number of wells at night due to the increase in friction.

Normal loss between the geared power and the pump jack amounts to 3.5 to 5.0 hp. per 1,000 ft. of rod line where the rod lines are of straight-line construction; improper suspension of the rods will cause the power loss to mount to maximum figure of 5 hp. per 1,000 ft. By taking advantage of the catenary effect in the construction of the rod line, using holdups and rollers at the proper points, and still using doll heads for supports, the power loss can be reduced to 0.85 to 1.25 hp. per 1,000 ft. of rod line traversing gently rolling ground and 2.25 to 2.50 hp. per 1,000 ft. over rough terrain.

The average cost of installing geared powers is approximately $150 per horsepower, exclusive of rod lines and jacks. On a power pumping 20 wells, with the rod lines to each well averaging 2,000 ft., the investment costs are substantially reduced by the elimination of a single horsepower per 1,000 ft. of rod line. There is also a reduction in the fuel requirements for operation of the power which amounts to a substantial saving where fuel must be purchased. Better designed rod lines are also the means of saving time and money in the balancing of the power to attain its maximum efficiency.

Catenary Curve

A catenary curve is the curve formed by the natural suspension of a line or flexible rod between two points. The equation used in its construction is as follows:

$$Y^2 = 2tx$$

where

Y = one-half the distance in feet between the suspension points

x = sag in feet at the lowest point

t = tension on rod line in pounds.

The formula for the curve made by suspending a line from two points of equal height is

$$LY^2 = 2tX$$

where

Y = one-half distance in feet between points of suspension

X = sag in feet midway between suspension

t = tension on rod line in pounds

L = weight of rods in pounds per foot.

Theoretically, such a curve would eliminate all of the friction caused by the contact of the rod line with the doll heads, provided that the rod-line tension was constant, but its construction is practically impossible because of the mechanical limitations and the modifications made necessary by the terrain. A chart published in The Oil and Gas Journal, June 18, 1936, Page 45, gives the maximum sag in feet for rod lines of different weight and length. It also can be used for determining sag and location of doll-head carriers on rod lines with suspension of unequal height. The formula can be adjusted to fit these cases.

Take Advantage of Contours

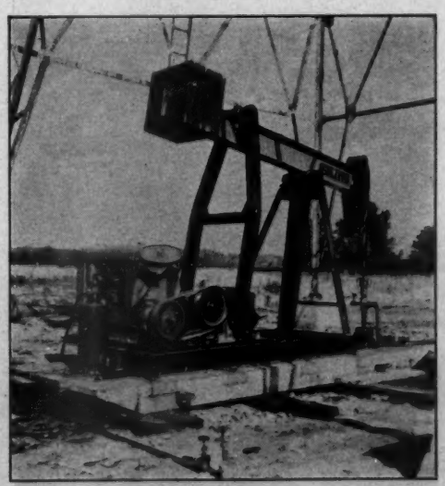
In practice, a careful analysis is made of the profile of the path of the line with attention being paid to taking advantage of the contours of the ground. In surveying the route of the line no effort is made to avoid hills and valleys. By proper location of the holdups, the catenary effect can be used advantageously. Even minor differences in elevation are utilized by the Pure Oil Co. production department; the terrain in the central basin area is not rough and 11½ ft. is the maximum sag used there. The rod lines are constructed so carefully that they barely touch the doll heads when the jack and sucker rods are on the upstroke.

Right: Penedulum-type pumping unit which can pump from two to eight wells. The steel skids are set on concrete and the internal-combustion engine is sheltered. Below: Pumper operating built-in knock-off on penedulum-type pumping unit. Pure Oil Co. lease near Clay City

After installation of the holdups the rod-line crew starts erection of the 2-in. pipes for supporting the doll-head carriers. Elevation of the top of each stake is established by stretching a Halliburton well-measuring line between the two points of suspension and then driving the stakes at 20-ft. intervals to match the elevation of the line at that point. The stakes are driven in Illinois as the thawing and freezing of the ground will force them out if they are set in concrete. Where sags are being placed in the lines near to the geared power or pumping jack, the stakes are made adjustable by using 2½-in. tubing for a bottom and inserting a 2-in. pipe in it; holes in both the 2 and 2½-in. pipe allow for lowering and raising of the doll head. On long lines, rollers are used to support every fourth rod.

Remodeling Old Lines

For remodeling old lines which have tall pipes to support the line in a level position, Pure Oil Co. has adopted a variation of the same procedure, the measuring line being stretched alongside the rod line and a welding torch used to cut the pipes at the proper height. This is much quicker than using pipe cutters and it does not leave a burr on the inside of the pipe which will prevent insertion of the doll-head carrier.



Individual pumping units driven by an internal-combustion engine using gas for fuel are mounted on steel or wooden skids and pump a well until power is installed

Two novel methods are used for elimination of friction in the knock-off posts and at all road crossings. Knock-off posts are made in the regular manner but on the jack side each one has a frame into which blocks made from doll heads can be inserted for guiding the line and preventing its flopping about; set screws are provided for adjustment of the blocks. At road crossings the usual junk casing is used but it has a wooden plug in each end which makes the pipe fluid tight except for the hole through which the rod line passes; by filling the pipe half full with oil, the line is always well lubricated in the road crossing.

Pumping Isolated Wells

Pure Oil Co.'s drilling and production department has been kept busy drilling and operating more than 600 wells in the central basin fields. Most of the completions are flowing wells and as soon as a group of wells approaches the pumping stage, erection of the geared power is started. For pumping isolated wells, individual twin-crank units driven by an internal-combustion engine using gas for fuel, are used. The individual units are often equipped with a backside attachment for pumping a neighboring well.

Recently another method was introduced for pumping from two to eight wells located reasonably close together but separated from other wells or surrounded by wells which will not require pumping for some time. An eight-well pumping unit is used in such cases. The pumping unit and its prime mover are mounted on steel skids and can be temporarily or permanently installed depending on how long it is expected to stay in that location. When permanently located they are always mounted on concrete foundations.

The pumping penedulum unit is driven by an internal-combustion engine which is also mounted on the skids. The double-reduction gear on the unit is equipped with two cranks, one of which is a wheel type fitted with adjustable counterbalances; the unit is also equipped with built-in knockoffs. This type unit is generally used to pump from two to six wells, most of which are located in a straight line, although by using swings it is often used to pump wells in all directions from the pendulum unit. The unit has four pull rods but by using branch swings its capacity can be increased.

Where individual units are equipped with backside attachments or the pendulum units are used for temporary pumping, rod lines are not constructed with such attention to detail unless it is evident they can be used on the permanent geared-power installation.

Positive-Displacement Oil Meters In Production Work

By L. R. VAN ARSDALE
Pittsburgh Equitable Meter Co.*

THE use of meters as a method of determining volumes of flowing liquids is one of the oldest phases of fluid measurement. As early as 1824 a forerunner of the present weigh-type meter was designed in England for use as a method of water measurement, and since then various types of mechanical meters have entered the picture. With the advent of the petroleum industry and its rapid growth, new applications have arisen, some of which are now being handled quite satisfactorily while others are still in experimental stage.

Oil meters of the positive displacement type are now widely used as a means of measurement of refined products, such as dispensing from service stations, delivery from tank trucks, and delivery to tank trucks. When properly installed at any of these points, meters have been found highly successful, giving greater accuracy, faster operation, and better records on total volumes than was possible by use of tank gages.

In discussing the application of these meters in the field, consideration must be given to the varying conditions which occur as the field approaches depletion. From a metering standpoint the life of a field may be broken down into three divisions, namely; flowing wells, pumping wells, and wells making water. There is some overlap of the latter condition; however, it should be considered as a separate phase in meter adaptions.†

Flowing Wells

On flowing wells the meter is normally located at the outlet of the separator and should be definitely located between the separator and the flow-control valve. A dump-type control valve may be used but snap action should not be permitted due to the shock this would place on the meter mechanism. The action of the control valve should be regulated to suit the operating range of the meter being used. This means that flow at all times must fall within the operating limits of the meter. Where pressures above atmospheric are maintained on the separator an unstable oil is being measured and must be kept in the liquid state as it passes through the meter; otherwise, entrained gas will be measured and a ficticious reading result.

This demands a stable oil through the pressure drop required to move the oil from the separator to the outlet side of the meter. Fig. 1 shows a typical curve for shrinkage versus pressure and as may be noted the curve tends to flatten out at the higher pressures with a critical point in the lower regions. This critical point normally falls at approximately 50-lb. gage pressure, and it can be said that above this point the danger of the gas entrainment is definitely eliminated. In a great many cases the separator may be successfully operated at pressures lower than 50 lb.; this, of course, depending on the chemical composition and physical properties of the oil. In most instances where entrained gas difficulties are encountered at low pressures the manner of installation serves as a remedy. For example: Where the separator may be operated at atmosphere or near atmosphere it is usually elevated and the meter may be installed on the ground

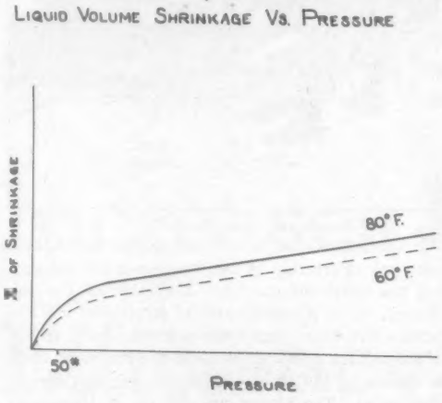
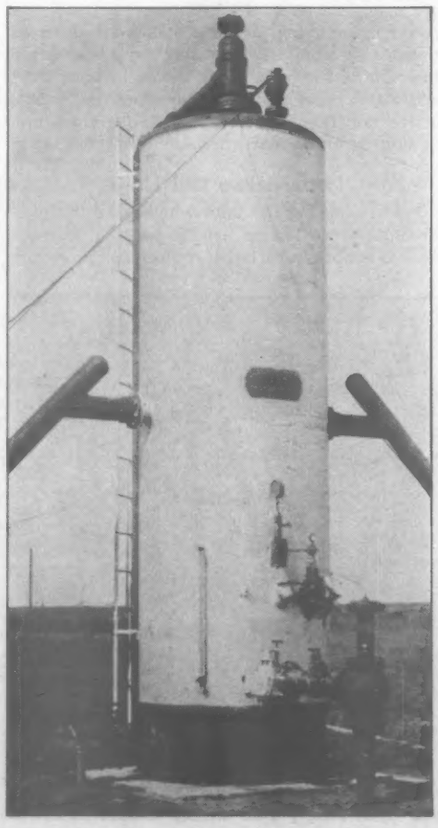


Fig. 1



Positive-displacement meter installed on separator outlet

*Author's title "Oil Meters of the Positive Displacement Type in Production Work."

†In the deleted section, the author describes the principle underlying the operation of positive displacement meters and discusses the component parts and terminology, including the measuring chamber, capillary seal, positive seal, slip, slip region and pressure absorption. Four types of meters, the disk meter, oscillating piston meter, piston meter and rotary meter, are described.

A. P. I

Presented before Mid-Continent district meeting at Wichita, Kans., on March 14-15, 1940

L. R. VAN ARSDALE

level, bringing about an increase in pressure from the separator to the meter due to the head of oil above the meter. Such a system has been found to work quite satisfactorily as a means of prevention of "breaking out" of gas.

Referring again to the shrinkage curve, we find that as long as entrained gas is not present the meter reads a true volume of oil; however, the volume does not correspond to the volume of the liquid at atmospheric pressure. It is therefore necessary to apply a correction factor to the meter reading and this factor can be taken from the curve for the pressure and temperature at which the separator is operating. Periodic tests may be made to check this factor by taking a sample under actual operating conditions. This test is made with a special calibrated sampler in which the sample is reduced to atmospheric conditions and the residual oil measured. A further test may be made by measuring the volume of gas released and analyzing same with a Podbielniak low-temperature distillation unit. From this analysis the liquid volume of the gas may be determined and the shrinkage factor set up accordingly. It should be remembered in using this curve that a thermal shrinkage factor is being used and not a thermal contraction factor. In order to correct for thermal expansion or contraction of the liquid to the base of 60° F. it is believed that a temperature-compensating device should be used in connection with the meter, otherwise a second correction factor must be applied and this would require a temperature recorder in connection with the meter. Some meters may be equipped with a compensating index which can be manually adjusted for the shrinkage factor. In this setup a dual reading is made, one showing actual volume passed and the other the volume corrected to atmospheric conditions. This would eliminate the necessity of daily computation of meter readings to obtain corrected results and would seem a desirable arrangement.

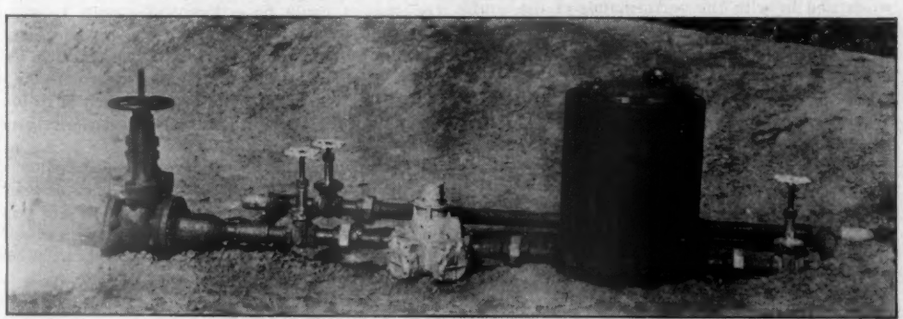
Meters offer a great many advantages in measurement on flowing wells and chiefly where unitization is being practiced. In this type operation a large amount of lease tankage is eliminated and lead lines from wells can be brought to the gasoline plant where the separators may be operated in a battery. Such a procedure also eliminates the necessity of a pipe-line gathering system with its pumps, manifolds, piping, etc. Not only is there considerable saving in equipment but the prevention of evaporation losses through handling

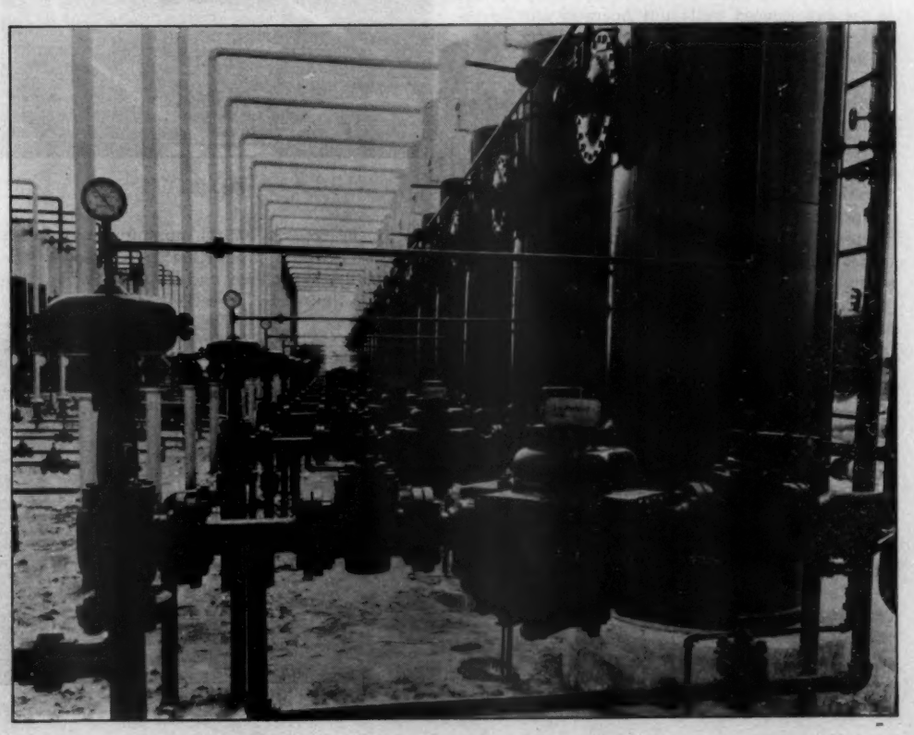
the oil under pressure is an important conservation measure.

In some systems multiple-stage separation may be desirable and by use of meters on the high-pressure separator the entire flow may be directed into one second-stage separator. A double check on the volume can be obtained in this type setup by using a master meter on the inlet of the low-pressure separator; however, a pressure regulator must be installed between the meter and the separator. In the multiple-stage system it is also possible to meter the oil under pressure with the oil stabilized to atmospheric conditions. This is accomplished by heat stabilization through use of steam heat exchangers between stages and the only correction necessary is for thermal expansion above 60° F. which can be accomplished by use of a temperature-compensating device.

In installations of this type, test equipment should be maintained and the work carried on by properly trained men. A calibration tank should be installed for testing of the meters on a dead oil and care must be exercised in using this tank since temperature variations may vary the drainage after emptying and thus change the displacement of the tank. In complying with this condition a light oil may be used providing the meter is of such design as to not be affected by changes in viscosity between the test oil and the oil to be metered. The length of time between tests is of course dependent on the design of the meter and the working conditions.

It is generally considered good practice to precede any meter with a strainer; however, on flowing wells this is seldom practiced since sand is about the only foreign material to be removed and would be a filtration job rather than straining. It has been found that fine-mesh strainers plug readily with fine sand as well as deposits of paraffin, requiring cleaning far more often than is practical.





Above: Meter and gas eliminator installed in lead line from well. Right: Meter installation on separator battery

Moving on from the newer fields we often find a number of flowing wells producing into a single separator for each lease. This system includes individual lead lines and a test separator so manifolded that the production from any one well may be directed through the test separator and into an individual tank for measurement. By installing a meter on the test separator, all manifolding on the outlet side of the test separator is eliminated and a separate tank for measurement is not required. In some cases individual lead lines are not used and in order to test an individual well all other lease production must be shut in. This can be overcome by using a portable test unit consisting of a gas eliminator and meter mounted on a trailer. This unit can be hooked in on each well and tests run for any length of time desired.

Pumping Wells

On pumping wells the manner of testing individual well production follows the same procedure as outlined above on flowing wells where a single separator is used for a number of wells, or in the instances where no separator is being used the gas eliminator may be used as the means of bypassing free gas and entrained gas thus bringing about measurement of the liquid only.

As the field further approaches depletion, we may find a number of wells on one lease producing a small quantity of oil to a tank battery. It is sometimes possible to consolidate a number of such leases with the entire production being taken care of by one tank battery. The individual leases produce to a single tank from where it is gravitated to the central battery with a meter installation on the gravity line for determination of the lease production.

Regarding correction for dissolved gas on a pumping well, this is again dependent on the chemical composition of the oil and in most cases the weathering process which occurs in storage is the determining factor and can quite often be disregarded. Referring to the consolidation of leases, the shrinkage may be disregarded since the meter reading will be used as a percentage factor for division of the entire production and the shrinkage is also a percentage factor with very little variance from one lease to another. On individual well tests the per cent of shrinkage generally falls within the limits of accuracy desired.

A strainer should be used in connection with the meter on a pumping well due to the possibility of stuffing-box packing from the well entering the meter. A five-mesh screen is sufficient for removal of foreign material of this type and danger of plugging from sand and paraffin is eliminated.

Wells Making Water

Most applications of meters on wells making water have been for the purpose of checking individual well production and this has been accomplished by passing the entire fluid through the meter and operating a sampler in connection with the meter. The sampling device pumps a small quantity of the liquid from the line into a sample bottle with the amount being proportionate to the volume passed by the meter. This sample is analyzed and the meter reading for the time corresponding to the sampling is corrected for clean oil. This process has worked out quite satisfactorily on well tests; however, the accuracy on the sampling has not approached the accuracy obtainable with the meter. The difficulty in taking a sample on a high-ratio basis is in making this a representative sample when several phases may be passing through the line such as free water, free oil, and emulsion. It is necessary at all times to agitate the line liquid before removing the sample and this is accomplished by making the sampler connection on the outlet side of the meter.

Considerable work has been done on samplers in order to obtain very accurate results and it is quite possible that this will eventually be accomplished. However, a better manner of handling this situation may be by preparing the oil for the meter rather than expect the meter to produce very accurate results under adverse conditions. The economies of such an arrangement have considerable possibility through treating and metering under pressure direct to the pipe line.

Conclusions

As outlined above, dissolved gas and entrained gas are the important factors in making installation of the meter through the various stages in the life of the field. Conditions of high temperatures, high pressures, and corrosives are problems which must be handled in the manufacture of the meter. The manufacturer must also pro-

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Taking the Pulse of the Pumping Well

By D. O. JOHNSON
Manager, Field Engineering Department, S. M. Jones Co.

A. P. I.

Presented before Mid-Continent district meeting at Wichita, Kans., on March 14-15, 1940

D. O. JOHNSON

IN these days of high taxes and low profits, the pumping well offers one of the few outstanding opportunities for lowering operating costs. The rapidly growing importance of economic pumping operations become clearer when it is considered that some 15,000 new wells will probably be put on the pump for the first time during 1940, and this forms just 1 year's quota of the constantly increasing number of pumping wells in the industry. . . .

A number of years of study on a large and varied cross-section of pumping wells in practically all fields has proved that most oil wells can be pumped economically and that a better understanding of pumping operation will pay for itself many times over. This is not only applied to the troublesome pumper that breaks equipment or the sneak-thief pumper which is superficially doing the best it can but also to the new pumping well which calls for sound equipment selection. . . .

The pumping system is after all composed of three main parts: (1) The motivating unit; (2) the pump and (3) the connecting link which is the sucker rod. The success of the system as a whole depends upon the proper functioning of each of its parts and as the most easily damaged two-thirds of the system works where we can't see them nor easily inspect them we need some method of gaging their general health in order to avoid trouble and to effect improvement. . . .

Taking the pulse of a pumping well is vital in judging the health of its system. The throb and vibration of the sucker rod will tell many things to the experienced well-study operator and tie together what would otherwise be superficial information in a safe and constructive way which means saved dollars in operating costs.

The purpose of well studies which are based in taking the pulse of the pumping well is to determine the cause for equipment failures, to improve efficiency of the system and to have a guide in the selection of new equipment. . . .

Most generally equipment fails due to fatigue of the metal and this fatigue is affected by the peak stress, the range of stress and the number of stress reversals to which the metal is subjected. The peak load on the polished rod, as measured by the polished-rod dynamometer, the range of load and the speed of operation of the well, might be called the normal fatigue factors. Then there are stress-raising factors such as vibration, fluid pound, erratic operation, corrosion pitting and embrittlement which might be called abnormal fatigue factors. . . .

The most common and practical method of roughly checking the efficiency of a pumping well, is to consider the ratio between the actual amount of fluid produced and the volume of fluid theoretically displaced, assuming the pump plunger to be traveling the same distance as the polished rod. The efficiency thus obtained is termed the "apparent volumetric efficiency." Most operators will agree that when the apparent volumetric efficiency is 80 per cent or above, it may be considered good.

The first cause for inefficiency is that the pump barrel does not fill completely and this may be due to a pump-off or to gas getting into the pump. The second factor influencing efficiency is the effective travel of the plunger. If for some reason, the pump plunger motion is restricted either because the plunger is too large or has too much friction in it, efficiency will be low. Leakage of the pump valve, or leakage past the plunger or through a hole in the tubing naturally will also produce low efficiency. . . .

A study of the load characteristic of a well very often may be used to good advantage in the purchase of new equipment for the particular well in question or for other wells in the same producing area. A careful study of the loads encountered when tied in with the performance of the equipment already installed will serve to prevent over or under equipping new wells.

Pumping-Well Study

In the study of pumping wells there are three general classifications of wells which must be considered: (1) A well whose production is limited by the capacity of the pumping equipment; (2) a well whose production is limited by the well's ability to produce, and (3) a well whose production is limited by proration.

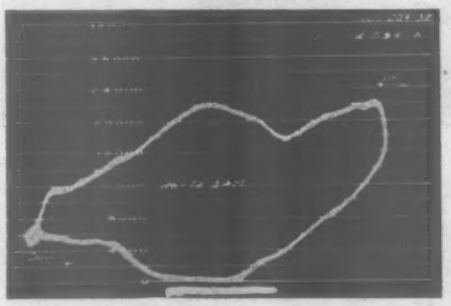


Fig. 1

Considering the first of these three classifications, more fluid could be lifted in such wells if equipment could be economically built to withstand the load, torque and horsepower necessary. Very often equipment is greatly overloaded in the production of such a well and numerous equipment failures result. The problem then is to balance the cost of these failures against the returns from the added production.

Practically all wells where water encroachment is a factor are in this classification sooner or later. Many wells in the Seminole, Okla., field are now operating with 80 to 95 per cent water cut and polished-rod loads run as high as 25,000 to 28,000 lb. with polished-rod horsepower as high as 60 to 70. A surface dynamometer card taken on such a well is illustrated in Fig. 1.

Sometimes a well may change greatly in a comparatively short length of time. As an example a Kansas well was weighed when first put on the pump and again a year later. When the first study was made the peak load was 12,600 lb. with a polished-rod horsepower of only 2.4 and there was no water produced; when the second study was made it was producing 78 per cent water and the load was 24,800 lb. and polished-rod horsepower 41.1. Fig. 2 shows a comparison of the load characteristic taken just a year apart.

Numerous potentials have been taken in the past on Kansas wells where operating speeds were run above 40 strokes per minute. . . . Many operators

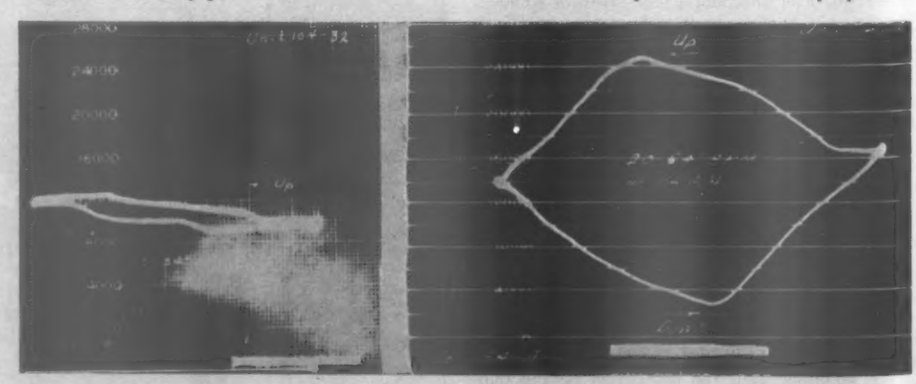


Fig. 2

Refining comes back

When people compliment us on the fine appearance of our new Dubbs unit we tell them the credit should go to U. O. P. . . . We value greatly the cooperation you have shown us in designing, building and starting the operation of this unit—I. A. ANSON, *president of Ben Franklin* to J. G. ALTHER, *vice president of Universal*

Once Ardmore, Oklahoma, was a booming refining center, but times changed Production went off, refineries shut down, oil companies moved away

For years refining was a lost art in Ardmore but now Ben Franklin Refining Company has brought it back to life

Ben Franklin is running 3500 barrels of crude oil per day This means pay checks for workers—better business for Ardmore

And Ben Franklin has installed a Dubbs-cracking unit—cracking 2000 barrels a day

Congratulations to the Ben Franklin officers on their good judgment Congratulations to Ardmore on its good fortune

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

agree that this operation is really a potential as to what the equipment will stand rather than a potential on the well.

The second classification of pumping wells is the one where the well is producing all of the fluid of which it is capable.

In a well of this type it is very easy for bad fluid-pound conditions to develop when the pump displacement is too great for the amount of fluid coming from the formation. In such a well it is important to keep the pump size to a minimum and to keep the speed of operation down to a point where the working barrel will fill as full as possible. Because of the low entrance pressure to the pump, large openings to the pump are often helpful in keeping gas from being pulled out of solution and partially gas-locking the pump. . . .

Very often operators will say that a well has to be pounded in order to get a bigger proportion of oil. While this may be true to some restricted extent, the pound should certainly be minimized as much as possible by keeping the well operating with a smaller pump displacement. Very often a severe pound can offset the advantage gained in production by effecting excessive equipment failures and down time. A situation of this type is illustrated in Fig. 3. Card *A* was taken at 20 strokes per minute and the card shows a bad pound. Sucker-rod failures had amounted to three per month. After installing a smaller plunger the pound was eliminated, rod failures stopped and monthly production was maintained.

In these days of proration most wells will probably fall in the third category where production is limited by law. Efficiency in such a well is not too important as the well is often producing only a small part of its capacity. However, when water encroachment makes it necessary to operate full time to produce the allowable or when bottom-hole pressures drop to a point where pounds may develop, this type of well then falls in one of the first two classifications and may become very troublesome.

New Fields

In newer fields where proration is put into effect early and formation pressures can be maintained for a longer period of time, the study of a few wells can form a basis for the selection of equipment with a consequent saving of investment.

The most common instrument used in the study of pumping wells is the polished-rod dynamometer. This type of instrument has been used for many years and much has been written on an interpretation of the load characteristics recorded. In order to understand just what the various types of dynamometer cards mean, it is well first to consider just what the dynamometer really measures. We might start by saying that it measures and records the instantaneous load or force acting on the polished rod at all points of the pumping stroke. The question then is, what causes the load or force to change the way it does and to produce all of the different types of load characteristics.

Newton's second law of motion states that force is equal to mass times acceleration. Acceleration is defined as the rate of change in velocity or direction of a moving particle. The motion imparted to the polished rod in a pumping well is one where acceleration is brought about both by changing velocity and by change in direction.

The first thing to consider in interpreting a dynamometer card is that whenever there is an increasing load either the beam hanger is being accelerated upward faster than the polished rod or the polished rod is being accelerated downward faster than the beam hanger. Conversely a decreasing load means either that the motion of the polished-rod hanger is being slowed down or some force is pushing up on the polished rod or accelerating it in an upward direction. In other words, the relative acceleration of the two members determines whether the load will rise or fall. . . .

The motive power of one member comes from the prime mover of the pumping unit and the motive power of the other member comes from disturbances below the surface of the well. The motion imparted to the beam hanger is approximately simple harmonic and this motion is imposed on the polished rod. If instead of a sucker-rod string and pump hung on the end of the polished rod, a weight equal to the dead weight of the rods was hung on and a dynamometer card taken, the card would show no area since no useful work is being done. . . . Such a card was accidentally obtained on a Kansas well when the sucker rods unscrewed close to the pump and is shown in Fig. 4. . . . This card really crosses itself so as to produce a positive and negative area. The positive area would represent energy put into the rod string from the beam hanger and the negative area energy which is released from the spring action of the sucker-rod string. The difference between these areas is the friction loss.

We may account for the difference between these two curves then by the fact that the rod string is not a rigid member but an elastic body like a spring in which energy may be stored and released.

If instead of a weight hung on the polished rod we were to fasten a strong spring to the ground and the other end to the polished rod and then to take a card we would expect the load to continue to increase all the way on the upstroke since the force necessary to stretch the spring would be continually increasing. . . . The card from an actual test shows a positive and negative area for energy given to and taken from the rod string.

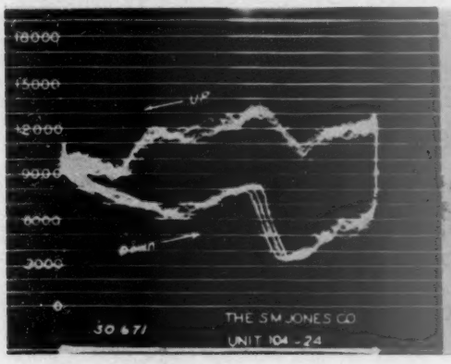


Fig. 3-A

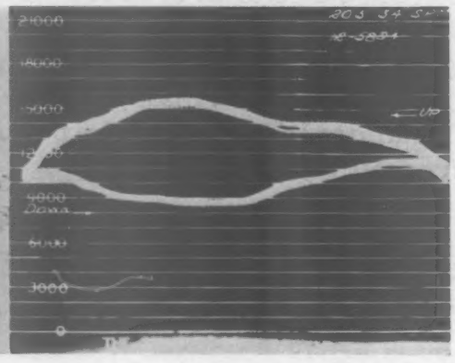


Fig. 3-B

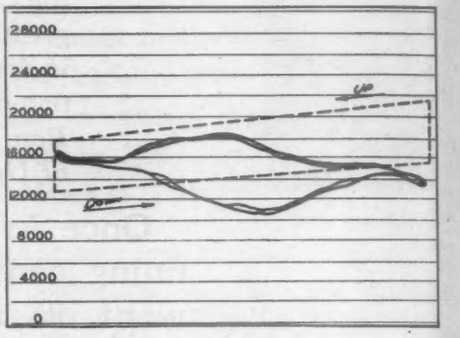


Fig. 5

Other dynamometer cards will show a loop at one or both ends and these may be explained as the result of having put excessive energy into the rod string during part of the stroke which is later released. The area inside the loop then represents energy returned from the rod string.

If instead of just a rigid weight at the polished rod we provide that a fluid load be picked up at the bottom of the stroke and dumped at the top of the stroke, the dynamometer card recorded would be similar to the dashed line in Fig. 5. This was calculated assuming a weight and fluid load equal to the rods and fluid in a well at Oklahoma City. The card shown is representative of a slow-speed characteristic and shows the peak load occurring at the center of the stroke. Actually the peak acceleration is at the very beginning of the stroke and although the polished rod is accelerated immediately the entire rod string and fluid load is not accelerated until the force is successively

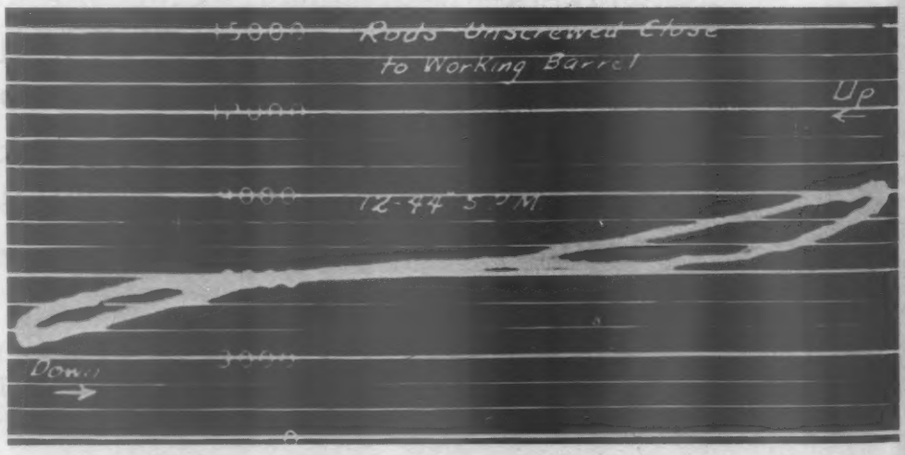


Fig. 4

(Continued on Page 67)

Hazards of Improper Rod Selection...

NATIONAL SUCKER RODS

4 GRADES FOR NON-CORROSIVE WELLS:

Grade 14 for light loads.

Grade 30 for medium and average loads.

Grade 40 for heavy loads.

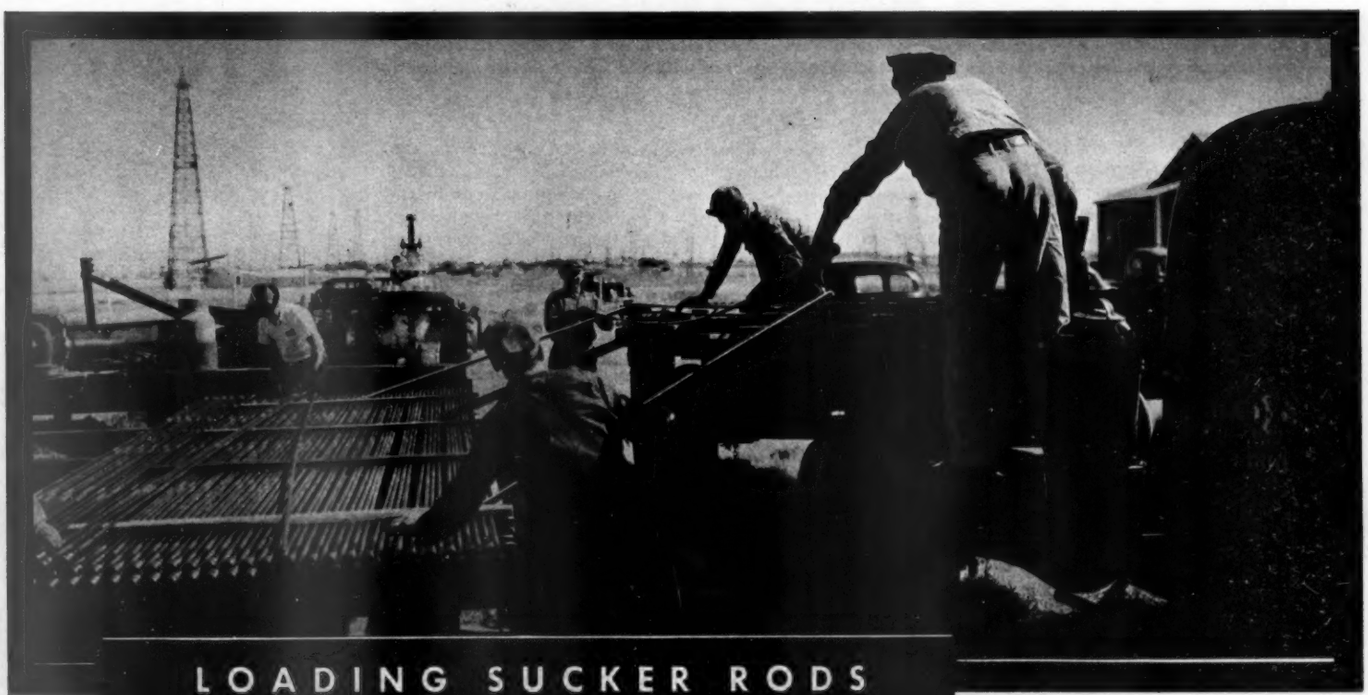
Grade 50 for very heavy loads.

3 GRADES FOR CORROSIVE WELLS:

Grade 71 for heavy loads where corrosion is moderate, but sulphides not severe.

Grade 81 for heavy loads where corrosion is bad, but sulphides not severe.

Grade 91 for heavy loads under severe corrosive and sulphide conditions.



LOADING SUCKER RODS

National line of Sucker Rods is so complete that specifying the rod that will give you the lowest ultimate lifting costs is greatly simplified. Complete stocks are maintained in all active fields. Contact your nearest National representative regarding your rod problems.

NATIONAL SUPPLY COMPANY

DIVISION OFFICES
FT. WORTH, TEXAS
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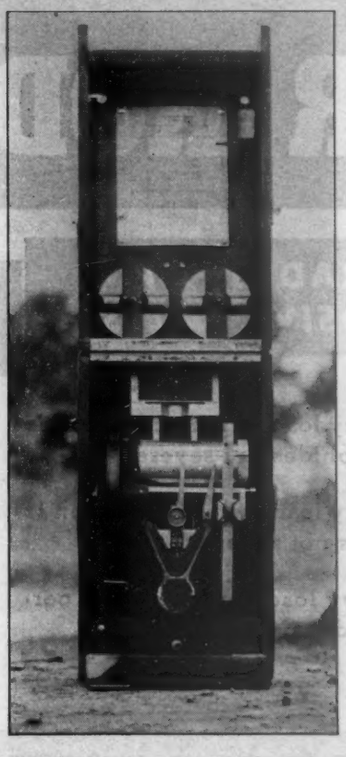


Load and Power Needs Of East Texas Wells . . .

. . as Shown by Dynamometer Tests

By GEORGE WEBER

Above is seen the type of dynagraph used in weighing wells in East Texas. A survey of 42 individual pumping units shows that actual polished-rod loads are substantially less than calculated loads, using the established formula derived from A.P.I. specifications

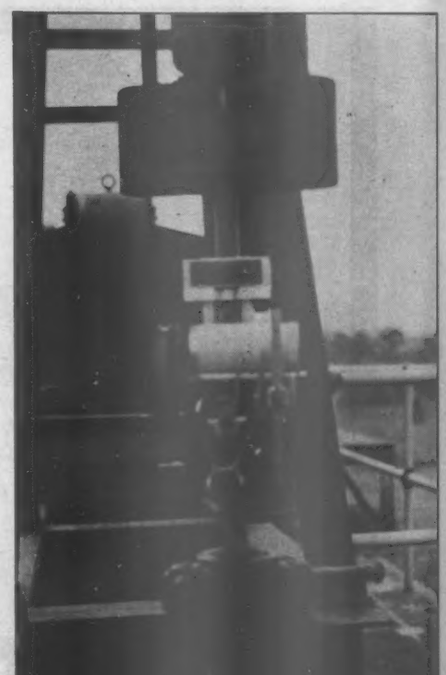
USE of the dynagraph for determining well loads in East Texas is finding wide application. Both in individual pumping units where the polished-rod load is studied and in central powers and backside-crank hookups where balance and surface friction are watched, the dynamometer has given field men a better insight into operations, providing higher pumping efficiencies.

Extensive dynamometer work in East Texas has been carried out by R. T. Shoemaker, of Oil Well Supply Co. A Westinghouse dynamometer was used in weighing hundreds of wells in all parts of the field. Most of the work on individual pumping units was on the west side. Interpretation of the dynamometer cards enabled operators to increase efficiency through changes of pump size, rod string, pump speed, length of stroke or pump submergence.

In other cases it checked the safety of equipment under actual stress conditions and showed power requirements as applied to polished rods at the surface. Aside from the individual cases, tabulation of data from a number of tests on individual well-pumping units is of general interest.

Representative Wells

Of 42 wells covered in the accompanying table, 32 were located either on the west edge or the west side of the field, 6 were east-side wells and 4 were located in the south end. The well data show a wide variety of combinations of pump and rod size, pump depth, pumping speed, length of stroke, and fluid lifted.



The dynagraph is fixed to the polished rod and measures its stretch over a fixed section throughout pumping cycle

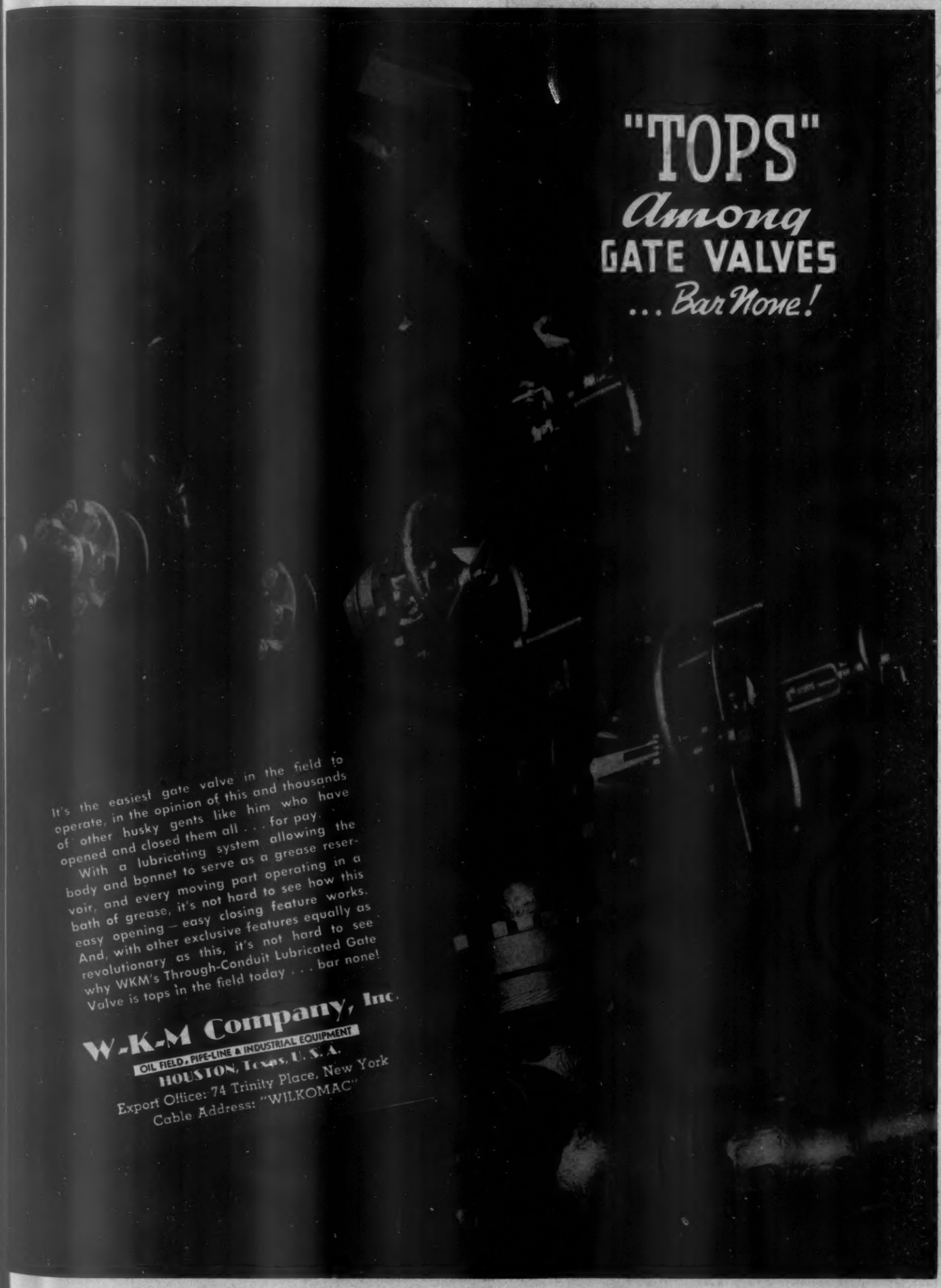
Of the west-side wells, the best representative group, it is noted that actual peak loads on the polished rods ran considerably less than the calculated data. The actual loads were measured on the dynamometer cards under the pumping conditions listed. The calculated maximum loads were obtained through use of the formula:

$$P = W \times L \times K$$

(Continued on Page 67)

DATA ON INDIVIDUAL PUMPING UNITS IN THE EAST TEXAS WELLS FROM DYNAMOMETER TESTS AND CALCULATIONS

Well loc.	Pump bore (in.)	Rod string: Size (in.)	Rod string: Length (ft.)	S.p.m.	Stroke (in.)	Fluid lifted (b.p.h.)	Dynamometer: Max. load (lb.)	Dynamometer: Min. load (lb.)	Calculated Max. load (lb.)	Average hp.	Peak hp.
W	1-25/32	¾	2,600	18.00	46.00		5,220	930	7,960	6.42	10.9
W	2¼	¾	2,525	18.50	52.00	23.0	7,230	1,770	9,900	6.14	17.6
W	2¼	¾	3,300	18.50	52.50		11,240	2,560	12,900	10.91	27.6
W	2¼	¾	3,700	17.50	74.00	25.5	11,400	640	15,250	15.35	37.4
W	2¼	¾	3,656	16.50	53.00		10,280	1,610	14,100	8.62	22.7
W	2¼	¾	3,200	15.00	64.00	32.0	10,280	1,927	12,500	11.30	24.9
W	2¼	¾	3,200	20.50	64.00		12,207	802	13,230	19.70	40.4
W	2¼	¾	3,578	23.00	62.00	35.0	11,886	802	15,100	12.60	42.8
W	2¼	¾	3,630	20.00	74.00		12,500	781	15,380	13.50	46.7
W	2¼	¾	3,550	19.50	53.00	21.6	9,155	2,408	14,060	6.88	23.9
W	2¼	¾	2,575	18.00	52.00	18.4	8,330	2,212	13,930	7.30	19.7
W	1½	⅝	3,500	9.25	84.00	4.2	5,730	910	7,590	3.75	11.2
W	1½	⅝	3,550	8.25	84.00	4.0	6,380	2,340	7,550	1.73	11.1
W	2¼	⅝	2,500	14.00	54.00	15.6	6,425	2,248	8,090	2.46	12.3
W	1¾	⅝	3,700	14.50	32.50	3.3	4,685	2,732	8,690	.95	5.6
W	2¼	⅝	3,550	18.50	51.50	31.0	6,767	1,301	11,890	5.72	16.3
W	2¼	¾	3,200	22.00	74.75	35.8	8,995	1,927	13,880	13.85	37.4
W	1¼	⅝	2,500	19.00	46.00	21.4	6,425	1,290	8,380	4.12	14.2
W	1½	⅝	2,854	14.00	42.00	10.0	4,560	2,080	5,440	.69	6.8
W	1½	⅝	2,854	17.00	42.00	10.0	4,690	1,820	6,120	.70	8.5
W	1½	⅝	2,854	14.00	42.00	10.0	4,030	1,560	5,960	.97	6.0
W	1½	⅝	2,327	14.50	42.00	10.0	5,470	1,430	4,940	1.22	8.4
W	1½	⅝	2,929	14.00	42.00	10.0	4,030	2,080	6,140	.58	6.0
W	1½	¾	3,525	17.50	46.50	8.2	7,607	3,210	9,640	1.91	15.6
W	1½	¾	3,606	17.00	46.50	11.4	7,070	2,890	9,330	2.45	14.1
W	1¼	¾	3,711	20.00	25.00	5.0	5,550	3,212	8,650	.60	7.0
W	1½	¾	2,919	22.00	46.75	6.3	7,230	1,930	8,240	3.69	18.7
W	1½	¾	3,594	21.00	46.75	4.8	8,350	3,210	10,100	2.64	20.8
W	1½	¾	3,575	20.00	44.00	6.0	7,710	3,210	9,880	2.99	17.1
W	1¾	¾	3,589	20.00	46.75	9.0	8,350	2,560	11,130	5.03	19.7
W	1-25/32	⅝	3,640	16.00	58.00	11.8	7,290	2,080	9,180	5.61	17.1
W	1¾	⅝	3,550	19.00	32.00	10.0	4,500	1,610	8,550	1.57	6.9
E	1¾	¾	3,664	18.00	32.00	8.0	9,050	3,900	10,700	3.09	13.2
E	2¼	¾	3,565	23.50	24.50		7,812	3,530	13,100	2.28	11.4
E	1¾	⅝	3,445	19.50	30.50	.08	8,031	3,051	8,260	2.82	12.1
E	1¼	⅝	3,675	21.50	43.00	4.6	8,191	1,606	8,140	7.22	19.1
E	1¾	⅝	3,200	21.00	54.00	3.3	6,906	1,285	8,360	7.33	19.8
E	1-25/32	⅝	3,690	16.00	44.00	8.0	5,860	2,730	8,970	2.08	10.4
S	1¾	⅝	3,550	17.00	45.00		5,210	1,820	8,740	2.37	10.1
S	2	¾	3,600	15.50	26.00	8.0	6,430	4,500	11,460	.68	6.5
S	1¾	¾	3,672	16.00	34.00	3.3	7,607	2,890	8,620	2.74	10.5
S	1¼	¾	3,611	16.00	34.00	8.0	7,400	5,140	9,420	1.17	10.2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Some Practical Aspects of WATER FLOODING in Eastern Oklahoma and Kansas

By LYNN C. CONVERSE* and R. R. HAWKINS†

A.P.I.—Presented before Mid-Continent district meeting at Wichita, Kans., March 14-15, 1940

UP to January 1, 1940, the shallow fields of Northeast Oklahoma and Southeast Kansas have produced 8,500,000 bbl. of water-flood oil and are putting 270,000 bbl. of oil into the pipe lines each month. Six thousand acres have been developed at an expense of some $7,500,000 plus $2,500,000 as an estimated cost of leases. With 3 to 5 years history back of several of the older floods and a number of properties finished or abandoned, it seems fitting that we stop and analyze the situation.

To complete the background, there are 4,603 acres now under flood in Oklahoma; 265 acres finished or abandoned and 200 acres under development, making a total of 5,068 acres, mostly concentrated in Nowata and Rogers counties and working in the Bartlesville sand. There is a total of 17 operators, with 2 operators controlling 66 per cent of the flood acreage.

In Kansas there are 673 acres under active flood with 271 acres shut down or abandoned, making a total of 944 acres. Four of the 16 Kansas operators also operate in Oklahoma making a total of 29 operators in the two-state area. Unlike Oklahoma, the Kansas operations are distributed over seven counties. All Kansas operations are in sands of the Cherokee shales.

For analytical purposes we will only consider floods which were started prior to 1938. While many of these floods are still producing, there is sufficient background to estimate, fairly accurately, the total amount of oil each will make, and such projections have been made. In order to make a comparison between the two states, we have set a value of $500 per acre upon the leaseholds. Sixty per cent of the leases were purchased on an over-riding royalty basis which will bring the costs from $100 for the poorest to $1,583 per acre for the best. Cash prices have ranged from junk value to $1,000 per acre for the productive areas.

Average Cost $1,000 Per Acre

Much of the acreage in Oklahoma where the average spacing is 2.5 acres per five-spot flood is now being developed at less than $1,000 per acre. As an average cost for development before 1938, $1,250 per acre is about right. For Kansas, where the average spacing is 2.04 acres per five-spot flood and where the older leases are not yet providing salvaged materials, $1,250 is probably a little conservative for development costs. Also for comparison, an arbitrary figure for lifting cost had to be arrived at. In Oklahoma 58 per cent of the wells are flowing so that the lifting cost consists principally of the cost of the input water supplied to the sand under pressure. All but 15 per cent of the wells in Kansas are pumped. Twenty cents per barrel has been used for lifting cost which will overreach the average for Oklahoma but be under the average lifting cost for Kansas.

Prior to 1938 there were 3,969 acres put under flood in Oklahoma, of which 220 acres have been completed or abandoned. The total production from this acreage up to December 1, 1939, was 6,685,300 bbl. with the projected total utlimate of 8,355,000 bbl. This will be seen to average 2,105 bbl. per acre. Using $1.10 per barrel as the average price received for the crude in Oklahoma, we have:

8,355,000 × $1.10	$9,190,500	
Less one-eighth royalty interest	1,148,800	
		$8,041,300
Lease cost at $500 per acre	1,984,500	
Development at $1,250 per acre	4,961,200	
Lifting cost at 20 cents per bbl.	1,671,000	
		8,616,700
Net loss		$ 575,400

Net loss per acre, $145.

Administrative expense and interest have not been shown as they are offset by the salvage of the plants and surface equipment.

Submarginal Acreage

Out of the 3,969 acres considered, 1,190 acres or 30 per cent were distinctly submarginal, producing to December 1, 1939, 1,020,100 bbl. and expected to finish at less than 1,120,000 bbl. or an average of 941 bbl. per acre. Using the same lease cost, development and lifting cost, these 1,190 acres represent a direct loss of $1,232,410 or more than $1,000 per acre. This may be charged up to the high cost of pioneering.

Taking the five best floods from our group of floods in Oklahoma started before 1938, and which are representative of most of the work done since then, we have a much more promising picture. These cover 969 acres and by weighted average are expected to produce 3,520 bbl. per acre. Again using the same lease costs, development and lifting cost we get a total net profit of $914,046 or an average of $934 per acre. The best subsequent flood has passed 7,000 bbl. per acre and has a projected recovery of 9,500 bbl. per acre.

Kansas had 12 floods started before 1938 which, with extensions, cover 711 acres. The extended expected return for the entire acreage is 2,053,714 bbl. or an average of 2,900 bbl. per acre. Lower gravity and inaccessibility to pipe lines has penalized the Kansas flood oil so that an average price of $1 is used for the period. Thus we have:

2,053,714 bbl. at $1	$2,053,714	
Less one-eighth royalty interest	231,714	
		$1,822,000
Lease cost at $500 per acre	355,500	
Development at $1,250 per acre	888,750	
Lifting cost at 20 cents per bbl.	472,500	
		1,716,750
Net profit		$ 105,250

This gives the earlier Kansas floods an average net profit of $148 per acre.

In Kansas 271 acres have been abandoned or shut down with a total production of 163,714 bbl. or 600 bbl. per acre. This 38 per cent of unprofitable acreage, using the same factors, shows a direct loss of $371,932 or $1,372 per acre. Again pioneering proves expensive.

A more cheerful side of the picture is shown in the five best floods in Kansas started before 1938. These floods have about finished their original pilot-plant areas and show an average yield of slightly better than 4,000 bbl. per acre and a net return of $950 per acre at $1 average price for the oil produced. For easy comparison the figures shown above for floods started before 1938 are tabulated:

	Oklahoma	Kansas
Average per acre production in bbl.	2,105	2,900
Submarginal per acre production	941	604
Five best leases per acre production	3,520	4,000
Five best leases per acre profit	$934	$950

While the sand saturations are higher in Kansas, the gravity of the oil at comparable depths is lower. In the flooded areas of Oklahoma, the viscosity has been fairly consistent while the Kansas floods have ranged from a low of 4.5 centipoises to a known 50 centipoises in explored areas. There is little difference in the average porosity and permeability of the flooded sections of both areas; the average porosity being 20 per cent and the permeability 47 millidarceys with Oklahoma about 2 millidarceys higher than Kansas. All things considered there is little choice between the two states, if properties are carefully selected.

Reason for Poor Showing

With 70 per cent of the acreage in Oklahoma and 40 per cent of the acreage in Kansas owned and operated by experienced Pennsylvania operators, why did the early Oklahoma and Kansas floods make such a poor showing? Flooding in the Bradford area had produced a vast amount of scientific and expert practice born of experience. Why then the large number of unprofitable floods in the Mid-Continent? Certainly the Bradford practices were used here, but many of the factors developed for the Bradford sand and oil characteristics did not apply to the sand and oil characteristics of the Mid-Continent. As an example, the viscosity of the Bradford oil was fairly consistent and as it changed but a small fraction by absorption under pressure, it was pretty well accepted as a constant and not a variable factor. Core interpretations by Bradford experience were very misleading. Many of us who started early have engineering reports on Oklahoma and Kansas properties in our files which were made up entirely from Bradford experience and which, in the light of our subsequent experience, are grossly inaccurate.

*Manager oil division, Max B. Miller & Co., Inc., Tulsa. †Consulting engineer, Parsons, Kans.

Of the numerous breakdowns made, the most interesting is the fact that with only two exceptions, all operators of the successful floods either first had a failure or put in a small pilot-plant flood from which the major flood was extended. It is also interesting to note that the two operators whose first floods were successful each followed with unprofitable floods. In general then, it can be said that our limited success in the early floods was due to lack of experience. By experience, and experience only, we are getting a set of factors and practices which apply to the oil and sand characteristics of the Mid-Continent. No doubt it will all have to be done over again if, as, and when the unconsolidated sands of other areas are flooded.

Causes of Failure

Some of the specific causes of failure which again come back to lack of experience are: (1) Too low saturation; (3) channeling by previous air-repressuring operations; (3) too wide spacing for the viscosity found; (4) too high and improper setting of packers in input wells and (5) failure to use proper pressures.

Very few areas in the Mid-Continent run consistent in either permeability or saturations and these variations are often extremely wide in crossing the axis of the Kansas shoe-string fields. For this reason the authors subscribe to the practice of some operators, to core each input well and wait for the core profile to do corrective shooting, both for its individual and field inconsistency. By shooting, the high and low permeable areas, within limits, can be made to take water at the same rate and the handling of excessive water early can be avoided. The dry permeability being equal, areas of low saturation should either be blocked off or left unshot to maintain an equal take.

The writers have streamlined laboratory procedure to the point where a well, cored one day, may be shot with a tailor-made shot the following day. With the porosity characteristics of the area known there is no necessity for determining the porosities for each well. By cleaning the permeability samples with a solvent under pressure, the permeabilities can be plotted almost as fast as the core is pulled. Getting the oil saturation takes more time but as soon as both permeability and saturation profiles are completed the shot can be cut to fit the sand in that particular well.

Corrective shooting helps to approach the ideal of a vertical line push, and where pumping is practiced, reduces the amount of water to be lifted as well as the total amount of water necessary to be introduced into the input wells. On shallow production where pressures are limited and in deep formations where several acres depend upon each input well, corrective shots are important. At intermediate depths, for flowing, standard shooting without coring is generally practiced where the sand is fairly consistent.

In the shallow fields, where most of the flooding to date has been done, little is known about viscosity and, because no standard method for the transportation of the oil sample from the well to the laboratory has been set, the recorded readings are of little value. Most of the samples have been brought to the laboratory in a bottle or fruit jar and the reading taken any time when convenient. Viscosity sampling should be standardized and a pressure bomb used for transportation of the sample. In the Kansas shoe strings the viscosity of the oil is the most important of all variables to be considered in selecting a property and choosing the spacing to be used.

Practice in Shoe-String Fields

With the viscosity of the oil, the permeability of the sand and the size of the shot hole known, spacing from water to oil is then a function of time only, and can be fitted to the economic ideas of the individual. Some like 2 years while others are willing to take 5 or 6. Fig. 1 is figured on 4 years to completion. With the water-to-oil distance maintained, the pattern is then a matter of convenience.

In the shoe-string fields there is a distinct advantage in using a rectangular pattern with the long axis of the rectangle running parallel with the long axis of the shoe string, as the lenses pinch out across the bar. Even in a sheet formation sand, the areal efficiency of the rectangle is greater. Because of the extremely low permeability of the Bradford sand the wells there had to be close spaced to make recovery within a reasonable time. The practice of close spacing was inherited from Bradford and standard patterns used whether the sand had an average permeability of 20 millidarceys or 80 millidarceys. If the spacing is right for 20-millidarcey sand, then, all else being equal, it should be nearly four times as long (water to oil) for 80-millidarcey sand. In many cases the development costs would be reduced by one-half or one-third if the spacing were adapted to the permeability of the sand and the viscosity of the oil.

Spacing for the maximum pressure that can be used for the time decided upon insures the greatest economy. It has erroneously been thought that there was an advantage in drawing in the spacing and using a lower surface pressure. However, a careful tabulation of operating costs against development costs shows a very marked economy in using both maximum pressure and maximum spacing. This is true throughout the entire range covered in Fig. 1.

The question of pumping vs. flowing has been given insufficient consideration for the Mid-Continent conditions and probably need analysis. While 50 per cent of the acreage is flowing, only 10 per cent of the operators are flowing their oil wells. Remembering that spacing is a function of time and considering that 100 bbl. of water can be pumped into the sand under pressure for the same expense as lifting 1 bbl. of oil to the surface, with its proportionate share of water, there seems to be no justification for pumping. When it is further considered that 20 per cent more oil must be recovered to pay the lifting cost, the economics are all in favor of flowing. Where there is a wide range of permeability, as is so frequently found in the Mid-Continent, and uniform shooting is practiced, the economy is of necessity with flowing.

The argument is advanced that without the additional pressure differential represented by the static head no oil will be recovered from below say 20 millidarceys and that, with the additional pressure all oil in the sand to 10 millidarceys will be recovered. True enough, in the same time interval, but of what value is this additional oil if it costs more to produce than its market value? Both of the authors originally accepted the habit of pumping, largely inherited from Bradford practice.

Experience in Nowata Field

Certainly under some sand conditions a larger recovery can be expected from proper flowing than from pumping, as has been demonstrated in the Nowata field. Of two adjoining floods in the same sand body, the older flood was produced by pumping. Two years later the second flood was started with delayed drilling and controlled flowing. Already the second flood has produced more than the first and by extension of the decline curve will produce 20 per cent more oil.

Flowing with tubing strings cemented into the sand, the same as the input wells, reduces both the development and lifting cost to the point where sands too low in saturation to justify pumping, can be flooded at a profit. There is the added advantage of later being able to cross flood with no additional well cost.

Eastern Oklahoma and Kansas do not have an adequate supply of surface water for any extensive flooding program. However, there is an abundance of water in the Arbuckle formation which underlies the oil sands in the eastern half of both states. The hydrogen sulfide content is easily dissipated, and given some attention, much of the calcium carbonate precipitates without the addition of chemicals. Treatment for a satisfactory input water is not difficult or expensive. Any additional expense is more than offset by the increased return due to a different interfacial tension than is found in surface water. The return

(Continued on Page 70)

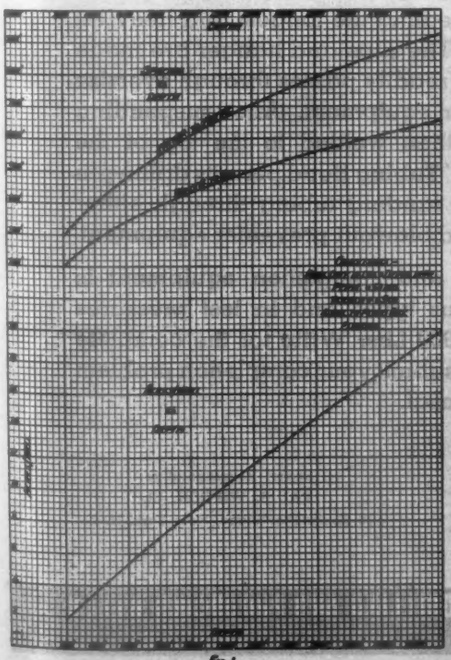

Fig. 1.

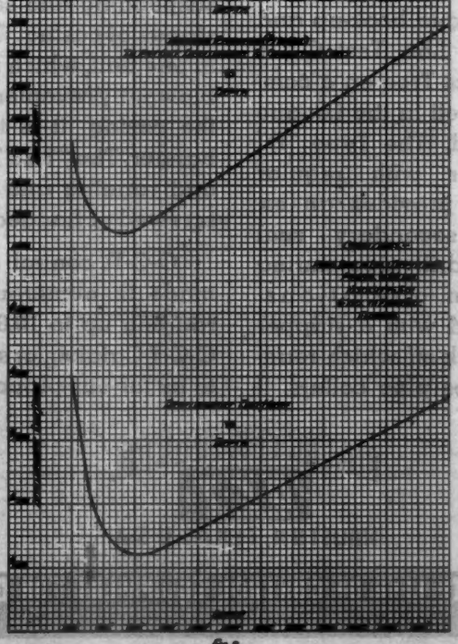

Fig. 2.

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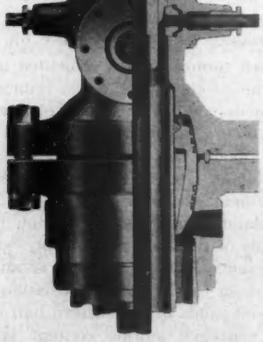

Cross-section view of an O-C-T Type "T-26" Tubing Head flanged above an O-C-T Type "C-7X" Casing Head.

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O-C-T MANUFACTURES A COMPLETE LINE OF CONTROL EQUIPMENT FOR DRILLING AND PRODUCING WELLS

Recent Developments in Method of Plugging Off Bottom-Hole Water In Arbuckle Lime Horizon

By J. N. MILES
Production Engineer, Cities Service Oil Co.

A. P. I.
Presented before Mid-Continent district meeting at Wichita, Kans., on March 14-15, 1940

J. N. MILES

THE history of Arbuckle lime production in Kansas has been that a well producing from this horizon eventually begins producing salt water and the rate increases as production is continued. In many cases the well is abandoned because the volume of salt water produced with the oil becomes large enough to make the well unprofitable. While it may be unprofitable to produce, there may be many barrels of oil remaining in the reservoir. For this reason salt water encroachment is one of the main controlling factors in the ultimate recovery of oil from a well or pool producing from the Arbuckle lime.

Salt-water encroachment may be controlled to some extent by the amount of penetration of the producing formation during completion of the well, and by the rate of withdrawal of oil from the formation. A small penetration and a low withdrawal rate are desirable in preventing water encroachment. Nevertheless, after these preventive measures are used to a greater or lesser extent, many wells produce large volumes of water in respect to the amount of oil produced, and any remedial work that would reduce this water volume would increase the economic life of the well. In this respect, the earlier the remedial work is done after water encroachment begins, the greater will be the benefits derived.

Numerous methods have been developed for plugging off bottom water in oil wells, all of which are very costly. Not many have proved very successful in the Arbuckle lime. A new method, or rather a modification of present methods, recently developed but still in the experimental stage, will be discussed in this paper. The outstanding advantages of this procedure are that the cost is much lower than other methods and that it has proved more successful to date. Its basic features are the use of acid to increase the permeability and porosity in the water-producing zone and the low-pressure placement of cement into the zone opened up by acid. Many dump bailer and tubing displacement jobs have been attempted, but their success has been limited by the small sealing area of the cement plug and the possibility of fracture if part of the plug must be drilled out.

Revised Procedure

The procedure as now used has been revised somewhat from that used on the original jobs in order to overcome some difficulties encountered and to expedite the work by reducing the number of tubing-pulling jobs. Some of the difficulties encountered have been: (1) Acidizing the water formation at a high rate; (2) displacing cement out of the tubing more rapidly than it will enter the formation; (3) reversing circulation to clean hole of surplus cement without allowing sufficient time for cement to take initial set; (4) formation of bridge in tubing after cementing, due to settling of residual cement; (5) formation of sheath of cement on face of oil-producing horizon following injection of cement; (6) using too large a batch of cement at one time. In respect to cleaning the sheath of cement off the face of the oil-producing horizon, it was found necessary to use a hydraulic gun and jet acid against this cement sheath. The pulling and running of tubing necessary in order to use the gun delayed the work and required extra expense. To reduce this delay and expense an insert hydraulic gun was designed to drop into the tubing and seat into a seating nipple welded on the bottom of the tubing. The gun can also be quickly removed by reversing circulation and pumping it out. The hydraulic gun consists of a head which extends below the tubing, and has one or more small openings, $\frac{1}{8}$ to $\frac{1}{16}$ in. in diameter, directed either to the side or downward, a brass seating ring approximately 12 in. above the head, and a strainer which extends above the seating nipple to catch any material which would tend to plug the jets. The seating nipple, which is about 12 in. long, may be used to seat an insert pump for testing the well after cementing, without pulling tubing. The gun is operated normally with a 1,000-lb. per sq. in. differential across the jets, which gives a tremendous hydraulic action. The use of acid in the jet gun is very effective in the removal of cement from the face of the formation or bore hole, because of the combination of hydraulic and corrosive action of acid.

Description of Procedure

The procedure used for cementing off bottom water is as follows:

1. Rods and tubing are pulled. A steel line is run to determine the total depth; if necessary, a sand pump should be run and the hole cleaned out. The threads and upset, when upset tubing is used, on the two bottom joints of tubing, are cut off and the joints are welded together. The seating nipple for the hydraulic gun is welded on the bottom joint of tubing. This is done to give a smooth joint for the lower 50 or 60 ft. so as to minimize the hazard of cementing the tubing in the hole. Tubing is then run in the well.

2. The hole is filled with fresh water, tubing lowered to bottom and hole is cleaned by pumping approximately 50 bbl. of fresh water down through the annular space and up through the tubing. With the hole full of water, the rate of intake of water into the formation is determined and if a fluid-level measuring device is used, the rate of fall of the fluid level can be measured. This information is necessary to determine the amount of acid which should be used. In general, if the formation takes water at a high rate less acid is required, but experience has shown that even with a high input rate of 3 or 4 bbl. per minute some acid is necessary before cement can be successfully injected into the formation.

3. Acid is run. Quantities of 15 per cent acid varying from 500 to 1,000 gal. have been used, depending on the input rate as determined above. The rate of injection of the acid should be kept low in order to keep most of the reaction close to the bore hole in the water zone where the cement plug is to be formed. On jobs performed to date the maximum injection rate has been 10 gal. per minute. The question arises as to how the acid is prevented from going into the oil-producing zone. From the results obtained by acidizing wells which have been drilled into water, the water production is usually increased in much greater ratio than the oil production. This is due to the miscibility of acid in water, which facilitates the passage of acid through water-bearing formations rather than through oil-bearing formations. Torrey,* in reference to water flooding, states that "the intake water if given an equal opportunity will go into the water pay with great rapidity and leave the oil pay relatively unaffected." From observation it has been found that this same condition holds true when an acid is introduced into an oil and water-bearing formation. After acid treatment the rate of water intake or the rate of fluid-level fall is again determined. Such information when compared to that obtained prior to the acid treatment will show the effect of the acid and give an indication as to the amount of cement to run.

4. The fluid is allowed to recede to a point near its static level. A batch of cement, not exceeding 15 sacks, is mixed in a 16-lb. slurry and is displaced through the tubing by fresh water at such a rate as to give a velocity of about 100 ft. per minute. The cement is pumped from the tubing in about 30 minutes, using a volume of water sufficient to displace all of the cement from the tubing, leaving the water level inside the tubing in balance with the water outside of the tubing. Longer periods increase the danger of cementing the tubing in the well. The purpose of the slow displacement is to prevent a large buildup of water and cement outside of the tubing. A cement buildup increases the possibilities of sticking the tubing and plugging off the oil zone. A large water buildup tends to force cement too far into the formation and thus reduce its effectiveness as a plug. There is a possibility of residual ce-

*"Selective Exclusion of Fluids From Wells," A.P.I., 1939.

ment settling out in the tubing and forming a bridge. This can be avoided by raising and lowering a steel line and weight in the lower part of the tubing. The cement, in some cases, has been followed with a sponge-rubber ball slightly larger than the diameter of the tubing. The purpose of the ball is to wipe residual cement from the tubing wall, thus preventing a bridge from forming. It is thought desirable to follow the fluid-level variations during cementing operations. A shutoff is obtained if the fluid does not return to its static level or if the rate of fall is slow. A rapid fall of fluid indicates that the water zone is still open, and another batch of cement should be run. As soon as the cement is displaced, a steel line with a short flat-bottomed weight is run to locate the top of the cement. Excess cement is circulated out of the hole, if, after setting 3 hours, the top of the cement plug is found to be higher than originally planned and the fluid level indicates a shutoff. It may be necessary to use the acid jet if the cement cannot be removed with water. The face of the oil zone is cleaned by using water through side jets in the hydraulic gun. The rate of fluid loss is the governing factor in determining when the cleaning is complete. If water fails to open the oil pay a weak solution of acid should be used, increasing the strength as required. If necessary to run another batch of cement the procedure as outlined is repeated, but not sooner than 3 hours after the first batch has been run, the amount of cement used depending upon the input rate or fluid-level fall after the first batch of cement has taken its initial set.

A cement slurry weighing about 16 lb. per gal. has minimum shrinkage on setting and less tendency to float in the displacement water than a lighter mixture. Injecting cement in small batches rather than in one large one reduces the hazard of cementing tubing or plugging off the oil zone.

Success of Remedial Work

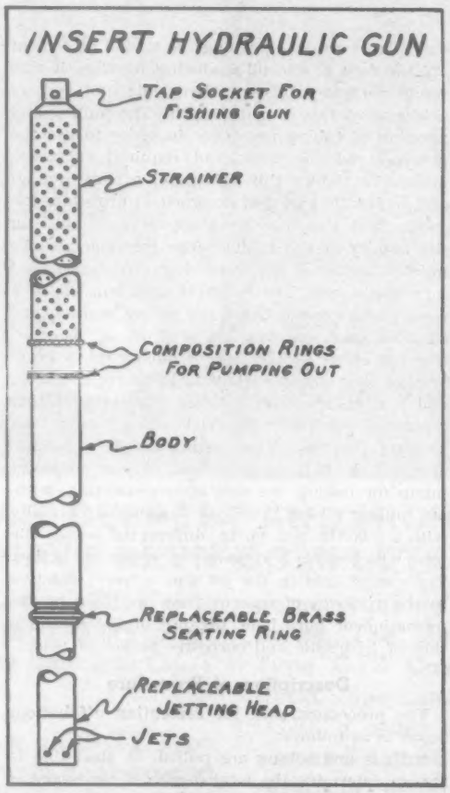
An accurate log of the producing formation is helpful in locating the oil zones, probable water zone and determining the amount of cement plug to be left in the hole. In respect to probabilities of success, wells with the greatest penetration and with pay zones separated by hard strata of limestone which has no porosity, offer the best chances for a successful job. Experience to date has been with wells having a high water-oil ratio over a considerable period of time; however, it is believed that a greater percentage of successful jobs may be expected if remedial work is done soon after salt-water encroachment is observed.

It is generally conceded that the success of remedial work is measured by the percentage reduction in water-oil ratio, providing the oil production has not been materially reduced.

A definite answer as to the permanency of this type of job is not yet available, but from the indications given by the first completed jobs, it appears that the work will be as permanent as other types of shutoff jobs. The first two wells worked on, after eliminating 96 per cent of water produced, have had an increase of 10 per cent in 6 months, which is practically the same rate of increase of salt-water encroachment as occurred prior to remedial work.

All of the wells in Table 1 are producing from Arbuckle lime and previous to remedial work, they were producing all the fluid that the pump-equipment could handle.

Well E had an input rate of more than 3 bbl. of water per minute before running cement and so it was not thought necessary to open the water zone with acid. Ten sacks of cement were run and very little entered the formation, although a complete shutoff of both oil and water resulted. While jetting the upper foot of formation with acid to bring back the oil, the well started taking fluid under a vacuum and upon testing, the water percentage was found to be the same as before cementing. The results here indicate the necessity for opening the water zone with acid to permit cement to penetrate farther into the formation.



The total cost per job should not exceed $1,000. The cost on five wells has averaged $1,062 per well, which includes some expense that will be eliminated from future jobs by improvement in procedure. The expense has been reduced over other types of remedial work since it is not necessary to move in drilling tools. All that is required is a pulling unit for handling the tubing plus the services furnished by cementing and acidizing service organizations.

At the average cost for lifting and disposal of salt water underground, a reduction of 100 bbl. of water per day produced from a well would pay out in about 10 months on a job costing $900. If a larger volume of water were shut off, the payout would be proportionally faster.

Conclusions

1. Salt-water encroachment can be controlled in three ways by: (*a*) Amount of penetration of producing formation, (*b*) rate of fluid withdrawal, and (*c*) remedial work such as water shutoffs.

2. Acid appears to be essential in shutoff work in Arbuckle lime to open the formation for penetration of cement.

3. Wells with greater amounts of penetration and hard strata between pay zones offer greater chances of success.

4. Indications are that the acid reaction will take place in the water zone in preference to the oil zone if given an equal opportunity and by the same token cement will enter the water zone in preference to the oil zone.

5. One of the most attractive features of this type of job is its lower cost.

6. The amount of success will depend largely upon the care of application and the experience of the operator.

Acknowledgments

To George Hoisington and Clarence Seeber of the Halliburton Oil Well Cementing Co. for their cooperation and aid in the progress of this work.

To the assistance of M. M. Mahaffey and R. C. Hauber of the Cities Service Oil Co.

Oil Meters in Production

(Continued from Page 45)

duce a meter which will have very little variation in measurement with changes in viscosity or from normal wear. Meters meeting these conditions have been designed and are on the market giving good operation for long periods of time without necessity of calibration or repair. However, it should be remembered that the positive displacement meter operates under severe conditions at the best. Bearings receive no lubrication except from the liquid passing through the line and they are subjected to the abrasives contained in the liquid. As is the case with any piece of mechanical equipment, speed of operation is an important factor with regard to rate of wear. If an automobile is operated at high speeds on a rough road the cost per mile is high and correspondingly if a meter is operated at high speeds in the presence of abrasives the cost per barrel metered is high. This concludes that the economies of metering are not only dependent on good design and manufacture but also on proper operation and maintenance.

BOOK REVIEW

GAS ENGINE HANDBOOK. Industrial Gas Section of the American Gas Association, 420 Lexington Avenue, New York. $1.

To date, jacket-water and exhaust-gas heat from gas engines has been used either: (1) To heat water for a variety of uses (boiler make-up, washing operations, space heating, or heat-exchanging operations), (2) to generate steam (for plant heating, equipment sterilization, or processing usage), or (3) to produce warm air (for space heating, or drying operations). The usual method is to conduct the heated-up cooling water within a closed system through some type of heat-exchanging coil, and to utilize exhaust-gas heat by (1) conducting the exhaust gases directly through a second heat-exchanging device such as a warm-air heater or a boiler, (2) water-jacketing the exhaust line and connecting it as a temperature "booster" in series with the engine-cooling-water system, or (3) water-jacketing the exhaust line and using it to heat water in a circulating system separate from the engine-cooling-water system. These methods are all covered in a special chapter of the handbook above mentioned.

TABLE 1—RESULTS OF PLUGGING OFF BOTTOM WATER

Well	Form. pen. (ft.)	Acid used (gal.)	Cement used sacks	Plug back (ft.)	Before Oil	Before Water	Before Per cent water	After Oil	After Water	After Per cent water	Results
A	12	500	29	11+	250	250	50	*75	0	0	Successful
B	36	1,000	22	2	78	750	91	80	40	53	Successful
C	34	1,000	50	9	24	702	97	22	27	55	Successful
D	22	500	50	17	51	459	90	79	450	85	Unsuccessful
E	5	0	10	3	22	700	97	22	700	97	Unsuccessful

*Rate of flow limited by 3/32-in. choke.

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TRANSMISSION COSTS

METALS in PRODUCTION

By W. L. NELSON

Oil-Well Pumps

IN the design of general pumping machinery, the use of metal-to-metal contact or of close clearances is usually avoided if the fluid contains abrasive materials or is corrosive. The alternative has been to use centrifugal pumps, air-lift systems, or blow-case types of equipment—or in the most extreme conditions to use the cheapest type of reciprocating pump or rotary pump, and plan on replacing the worn parts at frequent intervals.

In designing oil-well pumps, none of these principles is satisfactory. Centrifugal pumps have been used to some extent, and air lift can be used under some conditions but most installations are piston or plunger-type equipment. Even cheap installations cannot be utilized because the cost of pulling the pump far outweighs the cost of repair parts, hence cheapness of equipment is no advantage. No alternative remains but to make the barrel and plunger parts of as hard and abrasive-resistant a material as possible and to use corrosion-resistant material. Most crude oils carry some sand, particularly if the oil sand is of a loose or unconsolidated nature. Some of the sand can be eliminated by the use of strainers or well screens but usually enough sand gets into the pump to give serious wear. If the oil is also corrosive or contains corrosive salt brine, the combined attack of corrosion and sand is indeed difficult.

Parts Subject to Severest Wear

The parts that are subject to the most severe conditions are the balls and seats of the valves, pump barrels, pump plungers, pump liners and the cages or crowns which contain the valve. Two general types of materials are employed in the pump proper—either hard carburized alloy steels or extremely hard alloy cast irons. The alloy irons are chilled or heat-treated in some manner to give extreme hardness. If corrosion resistance is the primary consideration, such materials as 18-8 chrome-nickel stainless steel, chromium plated or covered steel, and high-chromium-nickel alloys such as Inconel (80 Ni-14 Cr) have been utilized. However, expensive materials such as those just mentioned have not been used extensively because they are destroyed about as rapidly by abrasion as regular materials and hence the extra cost cannot be justified. The use of stainless steel as a cold-pressed liner assists in keeping the cost down.

The use of chromium plate has met with some success. Difficulty in attaining a dense coating of metallic chromium that has no pinholes in it and that is tightly adherent at all points has been the main reason for failure. Certain manufacturers have been eminently successful in using chromium plate whereas others apparently have not been able to master the manufacturing difficulties.

Equipment which is to be plated with chromium should be designed so that sharp edges and grooves are avoided because the plating may crush at such points. The metal chromium is one of the hardest and most abrasion-resistant materials that is known and is extremely resistant to corrosion.

Chilled Cast-Iron Liners

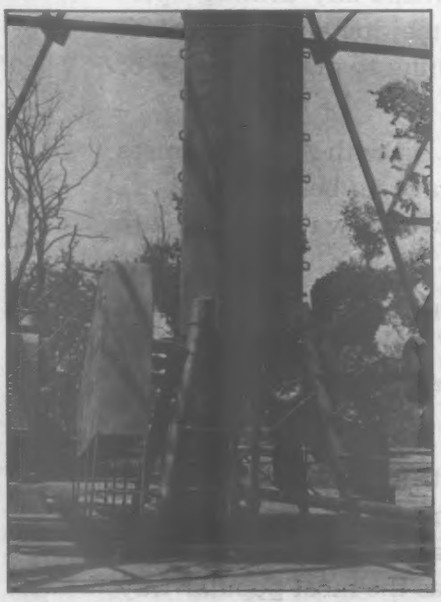
Chilled cast iron is an exceedingly hard material and has been found useful as a lining material. Recently liners of chilled cast iron have been produced by the use of centrifugal force. This results in a more dense uniform iron, and the impurities in the iron are gathered to the inner surface of the tube so that they can be cut out by machining. Such centrifugally cast liners after quenching and tempering are said to have 45 per cent more strength, 20 per cent more hardness, and 300 per cent more toughness than the best hardened gray iron liners. Alloy cast irons are also extremely hard and are not as brittle as chilled carbon cast irons of comparable hardness. Finally, materials which are somewhat similar to cast iron but depending upon metallic borides rather than carbides for producing hardness, are being studied. Examples of these are I.R. Metal (Di-Hard or Xaloy)[47] and Colmonoy[48], both of which are described as containing a combination of boron and nickel as the hardening constituent.

The general effect of alloy elements on the hardness of cast iron is indicated by the following tabulation[50]. The base iron from which the alloy irons were compounded contained 0.67 per cent combined carbon, 2.57 per cent graphitic carbon, 1.88 per cent silicon, 0.71 per cent manganese and other minor elements. In the tabulation no claim is made that the irons duplicate the materials used in oil-well pumps.

	Brinell	Tensile strength
Plain cast iron	217	39,000
0.43 molybdenum iron	224	45,000
1.0 molybdenum iron	240	53,000
Nickel molybdenum iron	230	47,000
0.5 chromium iron	230	43,000
0.25 vanadium iron	229	45,000

With suitable heat treatment or chilling, the differences shown in the tabulation can be accentuated but the general effect is the same.

The materials enumerated in this article are the recommendations of manufacturers of pumps and of alloy materials. In the past, The Oil and Gas Journal has published 12 articles of this general nature on the metals used in drilling and production—and in future articles, the entire industry, including transportation, gasoline plants, refining, shipping, and bulk plants, will be discussed. The materials here proposed are not necessarily the choice or recommendation of the editorial staff of The Oil and Gas Journal.



Fluid-driven radial pump driving rods on producing well

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SPECIAL MATERIALS RECOMMENDED FOR OIL-WELL PUMPS

Equipment—	Material—	Composition per cent C	Mn	Ni	Cr	Mo	Others	Brinel hardness	Notes:	Reference
Pump barrels and plungers	Inconel alloy	....	....	80	14	....	Fe 6.0	....	Corrosion resistant	21
	S.A.E. 4615 steel	0.15	0.55	1.8	....	0.25	.....	*640	Carburized	15–40
	†Stainless steel	10.1	....	8.0	18.0	....	.....	....	Corrosion resistant	44
	Metallic chromium covered	....	....	....	....	....	.....	....	Corrosion resistant	44
Valve cages or crowns	S.A.E. 4615 steel	0.15	0.55	1.8	....	0.25	.....	*660	Carburized	40
Pump liners	Molybdenum iron	3.2	....	....	....	0.43	Si 2.1	....	Stress relieved, quenched and drawn	11
	Nickel molybdenum iron	3.2	....	1.0	....	0.5	Si 1.37	....	Stress relieved, quenched and drawn	11
	Cast iron	3.0	....	....	....	....	Si 1.1	....	Partially chilled	46
	Chrome nickel moly iron	3.2	....	0.6	0.2	0.35	Si 2.1	....	Stress relieved, quenched and drawn	11–46
	Nitricast iron	2.75	....	....	1.22	0.24	Al 1.01 and Va 0.16	850 up‡	Nitrided	46
	S.A.E. 4615 steel	0.15	0.55	1.8	....	0.25	.....	*640	Carburized	6–15–10 47
	I.R. metal (Di-Hard or Xaloy) (Iron carbon alloy with nickel and boron)							850 up‡	Wear resistant	
	Cromium covered	....	....	....	....	....	.....	....	Wear and corrosion resistant	40–46–48

*Core hardness of 300 Brinell. †Both solid and as a tube cold-pressed into a steel jacket. ‡Vickers Diamond Brinell, 10 kg. load.

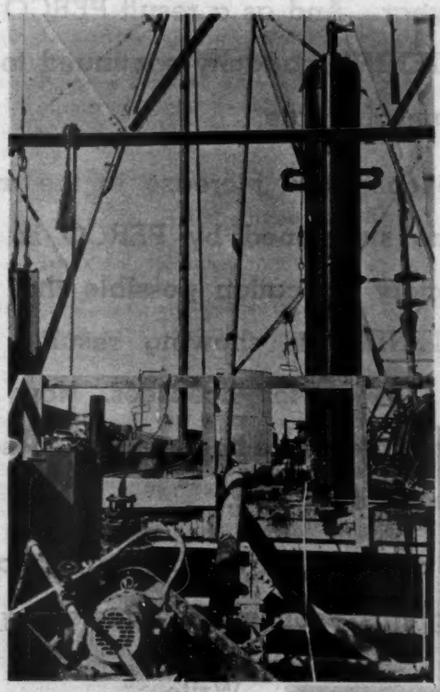
Perfect New Combination Degasser and Agitator

By L. P. STOCKMAN

CONTINENTAL OIL CO. engineers have developed a new combination degasser and agitator that in its first application in the Wasco field of Kern County, California, appears to answer a very decided need. The primary function of this installation is to reduce drilling costs through mud reconditioning by breaking down the viscosity of the drilling fluid, releasing entrained gas and air and eliminating the necessity of continually replacing weight materials and certain chemicals used in the mud. Careful and exact control of the various properties of drilling fluid is generally recognized to be of paramount importance in drilling operations and especially in fields such as Wasco where high temperatures are encountered and production under high pressure is obtained below 13,000 ft. Gas contamination is characteristic of practically all flush fields, but when one encounters maximum contamination along with high temperatures in combination with caving bentonitic shales a serious problem is presented.

Two combination degassers and agitators are in use by Continental Oil Co. in the Wasco field. The latest improved type being used on No. 1 Meyer in Section 7-27-24 and another of somewhat similar construction is being used in the drilling of No. 5-8-A Kern County Land in Section 8-27-24. The first installation was made on No. 1-C, a wildcat which Continental Oil Co. drilled in the Shafter district of Kern County in Section 12-28-24. This afforded engineers an opportunity to try out a new idea and to pick out the bugs which invariably exist in new equipment prior to use because they can not be foreseen in advance. As a result of this initial installation, Continental Oil Co. engineers have been able to perfect a new but somewhat similar unit that contains all the best features of the original unit and incorporates some new ideas that greatly improve performance under actual operating conditions.

The new degasser designed by Continental Oil Co. engineers is the outgrowth of considerable study as the mud problem arose a few years ago when the company was drilling its discovery well in the Wasco field. The importance of the mud problem was further accentuated in the drilling of Continental's No. 2-A Kern County Land, which was completed flowing 3,000 bbl. per day from 13,175 ft. with bottom of the hole at 15,004 ft. This well was completed in April 1938 and Continental's engineers had been studying the problem even before that time. The latest type of combination degasser and agitator perfected by Continental Oil Co. engineers is one of their own design and consists of a vertical tower fabricated of $\frac{3}{16}$-in. steel with a combination of baffles and nozzles arranged to secure maximum mud agitation and gas separation under a sustained vacuum. The vacuum may be furnished by an electric vacuum pump or a steam jet with a practically negligible consumption. The tower, which is 15 ft. high and has a diameter of 20 in., is built to withstand a maximum vacuum of 15 in. of mercury. The unit operates on mud circulated from the suction pit through the tower at the rate of about 220 g.p.m. The actuating power on one unit is a 14 by 7½ by 16-in. auxiliary pump.



Below: The new development of a combined degasser and agitator will make this type of agitator obsolete because of the tremendous savings effected in mud, weight material and chemicals in the new vacuum tower

Operation

The advantage of this new degasser lies in the fact that it increases the density of the drilling mud and in doing so recovers the weight mud

(Continued on Page 70)

Left: New type combination degasser and agitator installed on No. 1 Meyer in the Wasco field, California, by Continental Oil Co. Below: Combination degasser and agitator installed on No. 5-8-A Kern County Land of Continental Oil Co. in Wasco field. This is first type and operates under vacuum of 5 to 12 in. of mercury

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A.P.I. ABSTRACTS

Papers presented before spring meeting Mid-Continent district at Wichita, Kans., March 14-15, 1940

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Cable-Tool Drilling

By KURT SPRENGLING
Engineer
DeGolyer, MacNaughton & McGhee
Dallas, Tex.
and EUGENE A. STEPHENSON
Head of Department of Petroleum Engineering,
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THE basic principles employed in all cable-tool or churn-drilling operations have been virtually unaltered since the Chinese first drilled shallow wells for salt water in the early days of the Christian Era. Since then the human factor has been predominant in the mechanical progress and manual dexterity has been indispensable to successful drilling. Nevertheless, the significance of the driller's "touch" has been passed on from one generation to another without much explanation, because very few drillers are able to describe precisely those singularities in the behavior of the cable which are embodied in the phrase "feel of the line."

The objective of attempts to modernize cable-tool drilling should be, in part, to aid the driller in a better grasp of fundamental principles which control the response of the string of tools to the impulses received from the drilling machinery; it should also seek to promote reliance upon engineering data so that time can be devoted to the maintenance of equipment which otherwise is more or less neglected. The special purpose of this investigation has been to discover the most effective number of drilling strokes per minute which should be used for various tool combinations, so as to insure an approach to uniform performance regardless of depth.

Data gathered on cable-tool tests were carefully analyzed. Peaks in drilling speed were seen to correspond closely to low points in shutdown. A decided increase in the relative proportion of shutdown hours may also be observed where drilling frequencies depart from the natural frequencies of the system or its harmonic multiples, while a decrease may be seen in the relative number of shutdown hours where the drilling frequencies approach the natural frequencies in the system.

If it be assumed that the practical range of drilling frequencies is from 20 to 40 s.p.m., the drilling frequency used from the spudded depth to approximately 600 ft. would be an harmonic ¼ of the natural system frequency. At this depth the drilling frequency would have declined from the upper limit of 40 s.p.m. to the lower limit of 20 s.p.m. and it would then be necessary to shift from the harmonic ¼ to an harmonic ⅛ of the natural system frequency, which can be achieved by stepping up the strokes per minute to about 40. At 2,000 ft. the drilling frequency would again reach lower limit of the set frequency range, i.e., 20 s.p.m. Another shift would be required at this point from the harmonic ⅛ of the natural frequency to the absolute natural frequency while the number of strokes per minute is again increased to the upper limit.

If it proves to be more desirable to extend the range during which the two frequencies are fully synchronized, adjustments of the elasticity of the line or the weight of the tools used could be made. The disturbing factor to most drillers is the abrupt and drastic changes in drilling frequency. The prevailing practice among drillers seems to be to start at the maximum frequency available and follow a gradually decreasing drilling frequency curve. This procedure seems to indicate that the program followed by the driller approaches or meets the ideal program at several points.

The behavior of cable tools from a theoretical standpoint agrees closely with the observed conditions at various depths. The average drilling speeds approach maximum values at approximately 1,500 and 3,500 ft. at which points intersections with the ⅛ harmonic and the absolute frequencies are from 25 to 30 and 20 to 25 s.p.m. respectively.

Damping factors are more or less obscure. The result of an increased damping force is to diminish effectively the motion of the tools. Principal causes of damping include drilling frequencies not resonant with the natural frequencies of the system, viscous resistance of the well fluid and its suspended particles to the movement of line and tools, deviation of the temper screw from pure harmonic motion, deviation of the tool string from pure harmonic motion due to impacts against the formation and internal friction and energy absorption of the line and tools.

Energy absorption by the tools, other than that due to friction with the well bore and cutting fluid, would be due largely to independent vibration of the tool string. It is not at all inconceivable that the tools have their own entirely independent period of vibration; even though their unit mass is considerably greater than that of the drilling cable, nevertheless they may be regarded as a long flexible column suspended by one end. In this case their vibration is more likely to be of the wave type than compression and elongation, a type of vibration which could readily explain many broken stems and joints, since its magnitude would be restricted only by the diameter of the well bore. Drilling frequencies in reasonance with the natural period of the tool string tend to build up vibrations therein to their maximum value and the drilling frequency remains in the vicinity of the critical frequency. Violent stress reversals of this nature could easily cause serious strain and brittleness of the steel; a "whip cracking" wave reversal at the free end—bit end—of the tool string could set us stresses high enough to damage or fracture bit joints.

Some conclusions as to the type of hitch conducive to most effective drilling conditions may be drawn from the dynamometer study on drilling wells that was included as part of this investigation. It was assumed that the quantity of energy imparted to the formation is related to the difference between power consumption when the tools are swinging freely and when they are drilling. The limited data obtained show definitely that more work is done, or the kinetic energy at impact is greater when drilling is done with a high hitch.

The following recommendations are based upon the field and laboratory investigation. (1) Drilling frequencies used should at all times be maintained at the natural frequency of the system or one of its harmonic multiples. (2) The hitch used on the tools should be maintained at a uniform maximum height. (3) Power-transmission systems should be redesigned to accommodate modern power applications; a possible improvement would be direct connection of an engine, preferably a double-range electric motor, through a clutch to the end of the bull-wheel shaft. (4) Facilities for handling casing should be made available to those of the rotary rigs, making use of casing tongs and an accessible cathead. (5) Adjustable belt tension facilities should be installed in order to avoid repeated cutting of band-wheel belts. (6) A positive spooling device on the bull-wheel shaft should be made use of so as to prevent damage to the drilling line caused by uneven spooling. (7) Improved bull-wheel brakes should be devised—possibly a steel brake drum with a molded lining brake shoe cooled by circulating water.

●

Submergible Electrical Centrifugal Pumping Units and Their Application

By P. E. LOYE
Reda Pump Co.,
Bartlesville, Okla.

The working parts of the electrical, submergible, centrifugal pumping unit consist of a centrifugal pump direct connected to a motor through a protector section, the entire assembly being suspended in the well by the tubing. The pump is a vertical assembly of centrifugal impellers and diffusers. The motor, protector and pump shafts are direct connected, so in operation the assembled unit consists essentially of a single straight-line rotating part with the motor rotors at one end and the pump impellers at the other, with no gears, valves or reciprocating parts.

An electric switch to start and stop the pump is the only apparatus needed at the surface. Where medium or large volumes of fluid are being handled, the pump can be operated continuously; in a well having a volume under 100 bbl. per day, the pump may be operated through an intermitter which will institute the desired number of pumping periods automatically.

Over 750 wells in New York, Michigan, Illinois, California, and each of the Mid-Continent oil-producing states have used this type of pumping equipment. Because no rods are employed, smaller tubing can be used, 1¼-in. tubing being satisfactory for handling production rates up to 20 bbl. per hour. On a well having a depth of 11,500 ft., 7,000 ft. of 1¼-in. tubing may be used on the bottom of 4,500 ft. of 2-in. tubing.

Productivity index of a well may be obtained by allowing the well to assume a static level and, with the tubing full of fluid, starting the pump and then closing the valve and reading the pressure. The valve is then opened and the well allowed to produce at a measured rate for a period of time sufficient for the fluid level to reach a state of equilibrium. The valve is again closed and a reading taken of pressure for that producing rate. This may be repeated for several rates if desired. The difference in the pressure-gage readings indicates the fluid level existing under the two conditions and by plotting a graph the fluid level at other rates may be obtained.

Application and operating results of the submergible, electrical, centrifugal pump in regular production of oil wells are divided into four groups. These include small-allowable wells in water-drive fields, small-capacity wells in fields with low fluid levels, wells from which it is necessary to produce large volumes of water to obtain the allowable and deep wells where large horsepower units are required to make the operation of the well profitable. Average pumping cost per barrel of fluid per 1,000-ft. lift in the first group is 11.0 mills, the same for the second group is 16.0 mills, for the third group 5.0 mills, and for the fourth group 10.3 mills.

The lowest average pumping cost by this method is seen to have resulted in wells of the third group where large daily volumes have been handled from medium depths.

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Taking the Pulse of the Pumping Well

(Continued from Page 48)

transmitted from top to bottom of the string. Hence the peak load does not occur until sometime later.

Let us consider a few abnormal types of dynamometer cards which will illustrate the various factors influencing the buildup of a high load on the polished rod. The first of these is the so-called undertravel card (Fig. 6) where the reason for the

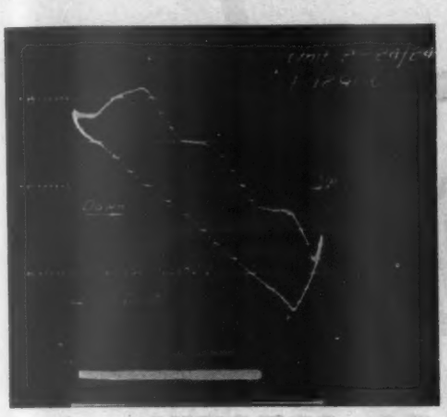

Fig. 6

high load is a restriction in the movement of the plunger. The load continues to increase for practically the whole duration of the upstroke instead of falling off as would be expected when the rods and fluid had attained their peak velocity and the hanger was slowing down. Such a characteristic might also be attained if the beam hanger continued to accelerate all the way on the upstroke.

Next let us consider the case of extreme overtravel of the plunger where the peak load is due to maximum stretch of the rods, resulting from the dynamic condition existing. The plunger in this case is traveling downward with a very high velocity and before it stops traveling downward the beam hanger is already being accelerated in an upward direction which means that the sucker-rod string is subjected to severe stretch. Now instead of, as normally, the load increasing on the upstroke it falls off all the way during the upstroke due to the release of the spring energy which was stored in the sucker-rod string.

A third case concerns a dynamometer card showing a remarkable change in load characteristic which was caused by a change in the velocity and acceleration characteristics of the beam hanger. This is a case where nothing was altered except the addition of counterbalance to the beam which had the effect of retarding the downstroke velocity and thus reducing the force necessary to stop the sucker-rod string and reverse its direction.

Because energy is stored in the sucker-rod string due to its spring action, this energy may be released to accelerate the polished rod from below so as to produce great variations in the load on the dynamometer. . . . As the polished-rod hanger is going down at the time with increasing velocity the load should naturally fall off but actually it increases. What really happens is that because of an extra pull on the polished rod due to a reflected stress wave, the polished rod is being actually accelerated in a downward direction at a greater rate of speed than the hanger, causing an increase in load.

To sum this up, any change in the polished-rod load must be accompanied by an acceleration of the beam hanger or polished rod and the force really measured by the polished-rod dynamometer is the deadweight load plus or minus that force resulting from the difference in acceleration of the beam hanger and polished rod. . . .

For any pumping well there may be determined the optimum pumping conditions for any given desired production and given surface equipment. by optimum pumping conditions is meant the best combination of speed, stroke and plunger size for best efficiency while at the same time keeping to a minimum, the load, range of load and number of reversals. . . .

Recently in a study at Seminole, Okla., a well which was being produced to the capacity of its equipment at 50-in., 62-in. and 74-in. strokes at several speeds and careful production data taken simultaneously with load data. It was discovered that the well could be operated at twenty-four 62-in. strokes per minute with less peak load, less range of load and fewer reversals than at twenty-eight 50-in. strokes per minute and at the same time get a little more production. When an attempt was made to carry this still further to the 74-in. hole, trouble was immediately experienced in that the belt loads became too high and the speed of the prime mover was reduced to a point where it was overloaded and gave bad speed regulation.

The comparative cards show that with the shortest stroke the high speed of operation necessary produces an unnecessarily high peak load at the beginning of the upstroke. A comparison of the loads and production are given in the following tabulation:

Speed	Stroke	Max. load	Range of load	Polished rod hp.	Production
28.2	50-in.	23,000	21,000	34.4	694
24.5	62-in.	18,800	16,550	32.6	775
21.5	74-in.	19,000	15,300	29.8	745

We have already remarked that one of the important studies to be made on pumping wells concerned improving efficiency. The polished-rod dynamometer can be very helpful in determining the causes for inefficiency. If the pump barrel is not filling properly, a pound of some magnitude will show up on the dynamometer card, if the well is pumping off then the position of the pound should progress when the well is speeded up. . . .

The consideration given in the previous part of this paper to the relative acceleration of beam hanger and polished rod helps to explain why some pounds are very difficult to denote in the dynamometer card. Acceleration forces released from the spring system of the sucker-rod string may come at such a time as to just overcome the pound or make it appear worse. . . .

The hardest type of pound to distinguish is one where gas is causing the pump not to fill sufficiently. Ordinarily such a dynamometer card will show quite an erratic operation because of the instability of the pump's filling and the fact that no two successive strokes effect similar conditions. . . .

If the fluid level characteristic of the well is known for static and pumping conditions, then the operator can be sure when a gas pound is present because if there is sufficient fluid level for proper submergence, and the pump is not filling properly, then gas getting into the pump must be the reason. . . .

A case of undertravel may be recognized from the general slope of the dynamometer card. . . . Some times a dynamometer card may show faulty valve action but such a card is really a freak rather than a common occurrence. . . .

The pumping wells in a new pool were recently studied so that the information gathered might be used as a guide in selecting equipment for additional wells which had to be put on the pump. The wells were found to be operating with comparatively high loads and low efficiency and the polished-rod horsepower was only about one-tenth of the rating of the pumping unit. Therefore, in selecting equipment for the next well a smaller pump, smaller sucker rods, and a smaller pumping unit were chosen, a cash saving in capital investment of approximately $1,000 resulting. . . .

Summary

To summarize, taking the pulse of the pumping well offers a procedure for materially reducing pumping costs on many operations. . . . Studies should first be classified as to purpose, that is, as to whether the problem is to eliminate equipment failures, to improve efficiency, or to gather important data useful as a guide in the selection of new equipment. Consideration should then be given to the type of well to be dealt with so that limitation may be better defined. This means knowing whether the well is operating to the capacity of the equipment, or to the capacity of the well, or whether it is prorated. When interpreting the dynamometer card in such work it should be borne in mind that the load recorded is really the deadweight load plus or minus the relative acceleration of the hanger and polished rod and that acceleration forces can come from the stored energy in rod strings as well as from the hanger. This principle explains many peculiar cards and allows a further exploitation of the information dynamometer cards contain to effect improved pumping results. Mature experience in this type of work indicates there is a large field for its further expansion and that what we know today is only a forerunner of tomorrow's possibilities and that the original method of lifting oil, although it has undergone much improvement, can still further be improved to meet pumping conditions and the need for lower pumping costs.

Acknowledgment

Acknowledgment is gratefully made to the following for material used in the preparation of this paper: J. Hendrickson, I.T.I.O. Co.; E. A. Jenkins, Skelly Oil Co., and Dr. E. N. Kemler, Gulf Oil Corp.

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Load and Power Needs Of East Texas Wells . . .

(Continued from Page 52)

Where:

P = peak polished-rod load in pounds
W = dead weight of rods plus fluid in lb. per ft.
L = length of sucker-rod string
K = impulse factor

$$K = 1 + \frac{S \times SPM}{5400}$$

Where

S = length of stroke in inches
SPM = strokes per minute.

The computed dead weight of fluid, incorporated in W, assumes a specific gravity of 1 for the fluid, equal to the weight of water. The average calculated peak load for polished rods on the 32 wells was 10,115 lb., while the average actual load as determined by the dynamometer was 7,549 lb. Similarly, calculated peak loads on wells in the south end and east side ran higher than actual dynamometer loads. The results of these tests in many cases may influence the choice of equip-

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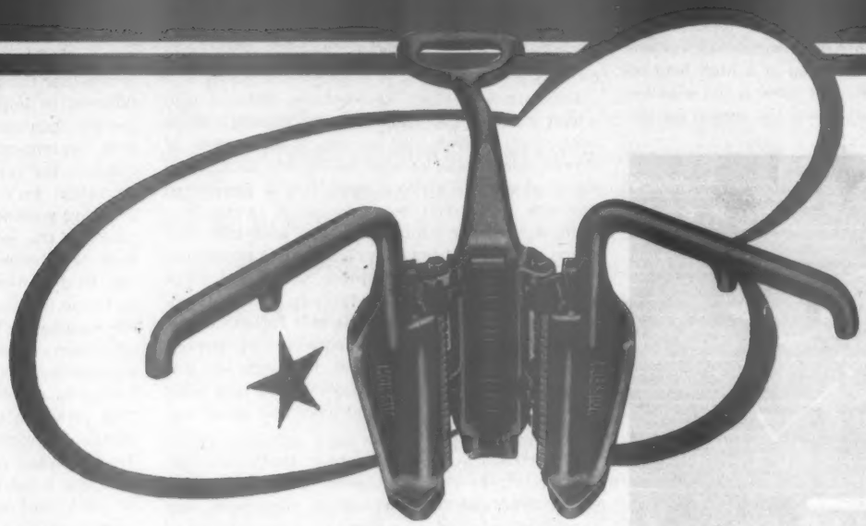

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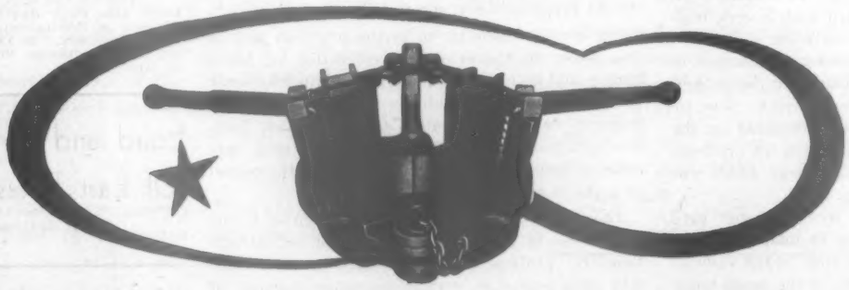

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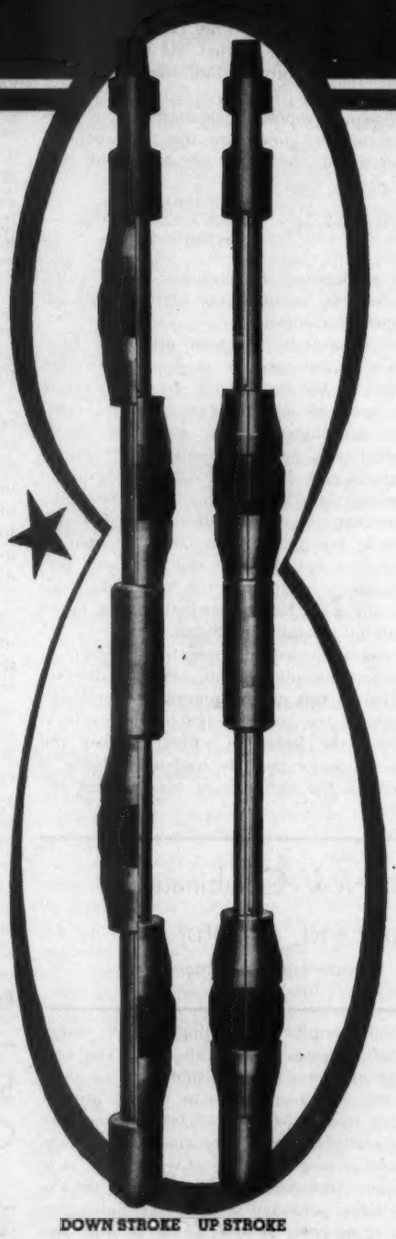

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ment grades better suited to actual pumping conditions.

Applied Horsepower

The horsepower requirements as tabulated also hold interest for the operator. For west-side pumping, power units with ratings less than 20 hp. are not recommended. However, the highest average horsepower required on the wells surveyed here was 19.7, and the average peak horsepower was 15.5. These figures concern only the applied power to the polished rod, so that the unit's power rating must cover, in addition, friction loss in surface equipment.

For average horsepower calculations, the average height of the curves on the dynamometer card represented the load in pounds in the formula:

$$\text{Horsepower} = \frac{\text{Load} \times SPM \times L}{33{,}000 \times 12}$$

The peak horsepower is computed, substituting the peak load as found at the highest point on the dynamometer curve.

In some electrically powered units the total horsepower requirement is easily found from power input to the entire unit. In internal-combustion units a safe margin of power rating must be chosen. Although west-side wells are generally installed with power exceeding their immediate needs to care for added water loads in future pumping, the dynamometer tests have tended to show that actual horsepower applied to polished rods is less than might be anticipated in some cases. An indication of the salt-water percentage in the fluid lifted in the individual wells may be found in the barrels-per-hour rating, based on the daily oil allowable of 20 bbl.

The dynagraph used in these tests, shown in the accompanying photograph, attaches directly to the polished rod during pumping operations. The stretch of the rod throughout the cycle is magnified in the indicator which outlines the card, and the factor used in measuring loads is determined by the modulus of elasticity of the polished rod.

Perfect New Combination Degasser and Agitator

(Continued from Page 63)

material and permits the drilling fluid to retain most of the necessary chemicals used. The cost of drilling mud and weight material for deep wells in the San Joaquin Basin at the present time ranges from $15,000 to $25,000 or more per well. This cost may be reduced about 30 per cent through use of this new type of equipment. It is quite obvious, therefore, that Continental Oil Co. engineers have perfected a unit that materially reduces drilling costs at least as far as mud and chemical costs are concerned, and this is no small matter in view of the mud and chemical cost per well just mentioned. The advantages of this installation are not limited by any means to the financial savings involved but also because it permits the use of satisfactory mud, and the crew therefore has the well under control at all times. The degasser, in addition to freeing gas that has become entrained in the mud, also frees any air that might have contaminated the drilling fluid coming from the hole. It is the opinion of an investigating committee comprised of San Joaquin Valley engineers that use of a degasser and agitator definitely reduces drill-pipe corrosion, a factor that has become of primary importance and concern during the past year. The degasser permits almost absolute control of mud viscosity, an important problem in deep drilling, and since heat decomposes certain chemicals of weight material, this control becomes of more importance. The mud return from No. 1 Meyer in the Wasco field approximates 165° F.

The Agitator Feature

The agitator feature of this new unit breaks down the viscosity of the drilling mud and by reducing the viscosity permits reclamation of the mud and weight material. The viscosity of mud from the well to the new unit is well above 150 seconds and after going through the unit the mud averages about 66 seconds or better. The viscosity of the mud is reduced mechanically by agitation. The original drilling mud used approximates 95 lb. per cu. ft. and returns from the well at about 77 lb. per cu. ft. After going through the new degasser, it weighs about 93 lb., indicating that it has been returned to almost its original weight. The unit now used operates under a vacuum of from 5 to 12 in. of mercury and uses an electrically operated vacuum pump. It is also possible and one unit now in operation is equipped to use a steam jet as the steam consumption is negligible. Neither of the two combination degasser and agitator units contains cooling coils, but present plans contemplate installation of such equipment within the tower as the cooling of the drilling mud may exert an important influence on the chemical constituents involved. This equipment is covered by several patents and the new improved combination unit will probably be made available to the entire industry at some future date.

Present practice in the control of viscosity, gel strength, and colloidal properties of drilling mud utilizes various treating chemicals such as sodium tetra pyrophosphate, quebracho, and chestnut extract with or without caustic soda, as well as numerous other similar chemical agents. It is interesting to note that present practice with respect to drilling fluid is just the opposite of the generally accepted method of a comparatively few years ago. This reflects deeper drilling with its higher temperatures and is the result of several years of intensive research. Instead of using a heavy mud weighted down with hematite or other similar agent as previously, operators are now using a mud of the proper viscosity fortified with chemicals and just enough weight material to accomplish the desired results. The use of chemicals has come into general use and has found favor with operators over a wide range of territory.

Some Practical Aspects Of Water Flooding

(Continued from Page 55)

of formation water is not only necessary but desirable for the same reason. Changing from surface water to formation water always results in a noticeable increase in daily production. Regardless of the kind of water used, care should be exercised to keep the dissolved oxygen in the input water to a minimum. While the effect is not noticeable before entering the sand, the corrosive result at the producing end is disastrous.

Most of us have been wondering to how low a recovery per acre we can successfully flood. In Fig. 1 we have developed a curve, using set conditions of permeability, viscosity, pressure and time, to show spacing vs. depth under flowing conditions. For this, Fig. 2 sets up a curve using the same factors, and oil at $1 per barrel, to show the minimum amount of oil which must be recovered under these conditions from the various depths to break even. In the Nowata field under flowing conditions and on large scale operation, acreage yielding as low as 1,500 bbl. per acre is being flooded without loss.

Fig. 1 showing spacing and development cost per acre, is based on a viscosity constant of 5 centipoises, which is a fair average for the depth range shown for eastern Oklahoma and Kansas. At 200 ft. the viscosity would be nearer 10 centipoises than 5 centipoises, in which case the spacing would have to be halved and the development cost more than doubled. If the viscosity were 30 centipoises the oil would not move at the pressure permissible for the depth unless the spacing were reduced beyond the economic limit. From the curve "Cost of Development" the error of the popular idea that profit advantage is with the shallow sands is apparent.

Because of the tendency of viscosity to reduce with depth there is no maximum in sight to the depth of sand bodies which can eventually be flooded at a profit. Viscosities lower than 5 centipoises used in the spacing chart will be found below 2,000 ft., and much wider spacings will allow sands with low saturations to be flooded at a profit.

With 6,000 acres developed and developing and a daily average production in excess of 9,000 bbl., water flooding in the Mid-Continent has passed through the pioneer stage and taken its place as a part of the producing industry. We have seen the early mistakes made through lack of experience and the improvement made by knowledge. While there will always be a fringe of imitators, progress in the industry will be led by the few students who profit by the scientific knowledge continually being developed and the few operators who have the courage of their convictions.

Right now there is being developed a great improvement in shooting practice for input wells which in itself allows an increase in spacing. Adding the feature of corrective shooting, the value of which is already proven, we now have a big advantage over the old common practice of standard shooting.

With maximum spacing for permeability and viscosity and maximum pressures, together with controlled flowing, much greater economies lie ahead. Because of the high permeabilities found in Oklahoma and Kansas, 10 times the spacing at Bradford can be used for equal depth and time interval.

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A.P.I. Committee Appointed to Complete Basic Premises

Completion and expansion of basic premises and data of the petroleum industry has been undertaken by a subcommittee on basic premises appointed by Chairman W. S. S. Rodgers of the American Petroleum Institute's central committee on public relations. Basic premise data already has been developed by the central group, and it is proposed to make preparation of additional material a continuing service.

E. H. Poe, American Gas Association, New York, is chairman of the new committee. Following are members: Norman B. Curtice, Pure Oil Co., Minneapolis; C. L. Henderson, Vickers Petroleum Co., Wichita, Kans.; Clarel B. Mapes, Mid-Continent Oil and Gas Association, Tulsa; G. Denny Moore, Gasoline Pump Manufacturers Association, New York; J. C. Richdale, Colonial-Beacon Oil Co., Boston, Mass; Miles Scull, Lion Oil Refining Co., El Dorado, Ark.; George H. Shaw, Cities Service Co., New York; Robert A. Warfel, Ohio Petroleum Marketers Association, Columbus, Ohio; J. C. Welliver, Sun Oil Co., Philadelphia, Pa.; J. S. Wood, Pan American Petroleum & Transport Co., New York; H. H. Anderson, Shell Oil Co., Inc., St. Louis, and Ralph C. Champlin, Ethyl Gasoline Corp., New York.

Members of the public relations administrative committee are advisory members of the committee. Fred Van Covern, direct of the Department of Statistics of the Institute, is a member exofficio.

A.P.I. ABSTRACTS

Papers presented before spring meeting Pacific Coast district at Los Angeles March 19, 1940

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Oil Well Cementing Factors Influencing Bond Between Cement and Formation

By P. H. JONES and DENIE BERDINE
Union Oil Co. of California, Wilmington, Calif.

Cement channeling and factors influencing the bond between set cement and formation were investigated in a series of 42 tests using relatively large-scale apparatus simulating conditions prevailing during the cementing of oil wells. The results which are presented photographically show that mud cakes will persist between set cement and permeable formations unless specific means, such as hydraulic jetting, mechanical scraping, or chemical action are employed for their removal. In oil-well cementing operations failures to obtain satisfactory results frequently are ascribed to channeling of the cement slurry, off-centered casing, and the presence of a mud cake between the set cement and the formation. In the latter case the mud cake may constitute a region of weakness that may break down or shrink, thereby providing a channel for migration of water past the cement seal. Obviously many other factors, such as cement quality, selection of stratum at which the shutoff is made, fracture of set cement while drilling, may influence greatly the success or failure of cementing operations. The scope of this investigation, however, was limited largely to studies of channeling, of the effects of mud cake on the bond between cement and formation, and of the relative values of various mechanical and chemical means for removal of mud cakes. The conclusions may be summarized as follows: Channeling and chimney formation of cement in the annulus is unlikely in the immediate region of the shoe but may occur near the top of the cement column. Wherever cement slurry is applied opposite formations having appreciable permeability, a residual mud cake will remain between the set cement and the formation unless specific means are employed to effect its removal. The presence of collars, movement of the casing, or circulation of water may reduce the thickness of the mud cake slightly, but will not remove it completely. Where the casing rests against the walls of the hole, residual cakes will be thicker than normal. There is a tendency for the cement slurry to be excluded from such regions of proximity, thus leaving longitudinal stringers of mud cake with no cement between the casing and the formation. Three methods were found to be effective in removing mud cakes: (1) Hydraulic action by direct impingement of fluid jets against the walls of the hole; (2) mechanical scraping by using mechanical devices on the casing, and alternately raising and lowering the casing. This is effective only over areas where scrapers or scratchers make a bearing on the wall of the hole; (3) acid treatment gave best results under atmospheric pressure conditions. Laboratory tests at high pressure indicate but do not prove effective mud-cake removal under these conditions may be obtained.

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Trends in Allowables in California

By L. L. AUBERT
Bankline Oil Co., Los Angeles, Calif.

The continuance of a healthy condition in the California petroleum industry during 1940 will require the maintenance of the state allowable at not more than the present figure. Since the development of reserves is still continuing at a faster rate than their depletion, the trend of individual well allowables will be definitely downward. To avoid inequities and inconsistencies and to maintain more reasonable ratios between the marginal, intermediate and top wells a gradual adjustment of all the factors of the flexible three-phase allocation formula for the distribution of the state quota will probably be made by the Central Committee. The maintenance of the state allowable at a fairly constant amount is necessary for the gradual adjustment of allowables as experience has demonstrated that notable fluctuations in individual well allowables lead to disruption and upheaval within the industry. If we assume that our present depth allowable is to remain the same for the remainder of this year and if we assume that we are to continue the procedure of reducing the power factor and the top allowable, it is safe to predict that by the end of this year the power factor will have to be reduced to 0.730 and the top allowable will have to be reduced to 135 bbl. a day. However, if this procedure is carried out some strange results will become evident. By December, for instance, a 150-bbl. well 12,000 ft. deep will receive a top allowable of 135 bbl. per day. This will be almost wholly made up of minimum depth allotment. Likewise, a 315-bbl. well 9,000 ft. deep will receive the top. It is hard to conceive of wells of this caliber receiving the same allowable as 2,000-bbl. wells. When carried to this extreme, the factors used in our present formula do not properly reflect the true conditions. Present procedure of lowering top allowables and power factor eventually leads to giving too much credit for depth and insufficient credit for potential. It is the author's opinion that the depth allowable should be gradually diminshed and that the power factor should be gradually modified, especially as it affects the larger intermediate wells and the small top wells. Gradual modification of the power factor would have the effect of raising the required potential for top wells. I believe the minimum potential required for top wells should be about 1,500 bbl. a day. The matter of these modifications is left to the discretion of the Central Committee. If that body should shortly see fit to commence to modify the present factors, we can safely assume that by the end of the year the top allowable will not have to be reduced below 155 bbl. a day. The effect on the marginal wells and the small intermediate wells will hardly be noticed. The greatest change will occur in the large intermediate wells and in the present small top wells. Drastic and sudden changes in the uniform allocation formula are inadvisable; however, a definite plan of procedure, to meet an obvious growing condition of inequity, should be followed. The state allowable, for at least the next year, cannot be raised but it may have to be lowered. The completion of new and recompleted wells, although on the decline, is still too rapid to be comfortably absorbed. The trend of the allowable of the individual well is definitely downward. How far it will have to go in this direction depends upon the program decided upon by the Central Committee. The economic law of diminishing returns is really at work.

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Bottom-Hole Control of Gas Production

By E. W. McALLISTER
Kettleman North Dome Association, Avenal, Calif.

The author describes the design and operation of two general types of bottom-hole-flow controls which are adjustable from the surface by means of instruments run on a small wire line. These devices were designed primarily to control the gas-oil ratios of wells in which the gas cap can be segregated from the oil-producing sands by means of a packer. The results of a typical installation are shown and discussed and special uses of the instruments are pointed out. The bottom-hole chokes of flow controls discussed were designed primarily for use in fields having an overlying gas cap which can be isolated from the lower oil-producing sands. More and more installations are being made in fields of this type as operators become gas-conservation minded either because of legal aspects or in an effort to conserve reservoir energy. The bottom-hole chokes or flow controls are designed to permit the passage of gas into the tubing string from the annular space between the tubing and the casing. The equipment differs from the pressure differential and velocity-type flow or kickoff valves in that the flow of gas through the device is controlled by various sized orifices which may be changed or adjusted from the surface by means of tools run on a small wire line. The location of this equipment in the tubing string is fixed and cannot be changed without raising or lowering the tubing, hence before its installation it is necessary for the operator to predetermine as nearly as possible the location of the choke and the auxiliary equipment so as to accomplish the results desired. At present there are two general types of controls in use and both types of chokes or flow controls may be adjusted or changed under pressure by means of a lubricator such as is used in running subsurface-pressure instruments. It is safe practice, and necessary in wells of high pressure, to shut a well in and equalize the casing and tubing pressures through the surface connections prior to making any adjustments, thus averting any possibility of releasing suddenly a discharge of gas or oil under pressure which may blow the tools up the hole and kink the wire line. The most common use of the bottom-hole choke or flow control is to install it in the tubing string opposite a gas zone that has been isolated from a lower oil-producing sand by means of a packer run on the tubing and set in a cemented blank section between the two zones. Gas is admitted to the flow string by way of the flow control and gas lifts the oil, which enters from below.

●

Practical Utilization of Rate-of-Penetration Drilling Data

By C. A. YEATMAN
Shell Oil Co., Inc., Los Angeles, Calif.

The importance of rate of penetration achieved during drilling as a clue to a classification of the type of formation being penetrated has been recognized for some time. The reduction of this factor from a casual observation to a strict measurement has definitely increased its value not only as an indicator of the type of formation being penetrated by the drill but also as an aid in the development of more economical drilling technique.

QUESTIONS ON TECHNOLOGY

By Charles K. Francis, Ph. D., Technical Editor

Reaction of Oil With Permanganate Indicates Admixture

Would you be kind enough to advise me as to what is the permanganate number of a lubricating oil and what is its significance?—C. E. H.

The literature available does not reveal any information about a permanganate number as related to lubricating oil. Potassium permanganate is a powerful oxidizing reagent which is used as a standard solution for the analysis of many substances.

The quantitative oxidation of the ferrous to the ferric condition when potassium permanganate is added to the oils solution, in the presence of sulfuric acid, will serve to illustrate:

$$10\ Fe\ SO_4 - 2\ KMn\ O_4 + 8H_2SO_4 = 5\ Fe_2(SO_4)_3 + K_2SO_4 + 2\ Mn\ SO_4 + 8H_2O$$

This equation suggests that 2 KMn O_4 are equivalent to 5 oxygen atoms, as if 2 KMn O_4 = K_2O + 2 Mn O + 5O. Therefore a normal standard solution would contain one-fifth the molecular weight of K Mn O_4.

This reagent has no action on a pure mineral oil but does react with several metals, their salts, and substances that are subject to oxidation. Therefore, any action with potassium permanganate would indicate the presence of other substances than pure petroleum oils.

Certain oils derived from animal fats, fish and plants are blended with mineral oil for certain kinds of service. Similar materials are present in greases. Such compounded oils and greases would react with potassium permanganate.

Significance of Aniline Point Applied to Petroleum Stocks

I am interested in learning more about the significance of the aniline point with regard to cracking stocks. I know it is used alone with the carbon residue to estimate the quality of charging stocks to cracking furnaces but do not know exactly how to interpret the results. Can you give me any information with regard to the interpretation?—W. F. K.

The critical temperature of solution of aniline in gasoline, and other petroleum liquids, as a basis for the quantitative estimation of aromatic and cyclic hydrocarbons, was first proposed by Chavanne and Simon. The critical temperature of solution is first found for the gasoline and then for the gasoline which has been freed from any aromatics by nitration and washing with sulfuric acid. The two temperatures being indicated by T_1 and T_2, the aromatic content is $Ar = k\ (T_2 - T_1)$. Assuming T_a and T_c for the critical temperatures of gasoline in aniline by acyclic and saturated cyclic hydrocarbons respectively, present in the gasoline if separated, then the quantity of the latter is given by

$$C = \frac{T_a - T_2}{T_a - T_c}\ (100 - Ar)$$

However, only applicable when the percentage of aromatics does not exceed 15 or 20 and then $k = 1.18$. The values for T_a and T_c may be accepted as 72° and 40° C. respectively. Where it is found than ethylinic hydrocarbons are present to the extent of E per cent, expressed as amylene then for T_1 in the formula should be corrected to $T - 0.4\ E$.

The directions for making the determination were given on this page of The Oil and Gas Journal, March 24, 1938.

The information from the test is an index of the type of oil, paraffinicity, and is especially applied for determining the solvent power of petroleum naphthas.

Moore and Hobson report a series of investigations of this test and report these conclusions:

The general increase in aniline point after removal of aromatic and unsaturates was 14.7° C. The aniline point increased 5.3° C. after the removal of 13.4 per cent unsatureds, meaning a change in the aniline point of 1° C. corresponded to 2.59 per cent in unsaturated hydrocarbons. So a decrease of 9.6° C. is equivalent to 24.9 per cent unsaturated hydrocarbons. Hence the difference between 14.7 and 9.6 or 5.1 corresponding to 5.8 per cent aromatics indicates the quantity of these present. Additional interpretations are given in the reference.

References: Compt. rend. 1919, 169 and 185. Chem. Abs. 1920, 117. D. A. Howes, J. Inst. Pet. Tech., 16, 54, 1930. Moore and Hobson, J. Inst. Pet. Tech., 11, 587 1925.

Physical and Chemical Laws and Principles Used in the Petroleum Industry

HYDROGEN ION CONCENTRATION AND HYDROGEN EQUIVALENT

Hydrogen ion concentration or pH value is the logarithem of the reciprocal of the gram ionic hydrogen equivalent per liter, or

$$pH = \frac{1}{(H^+)}\ \text{per liter.}$$

Water has a concentration of H^+ ion of 10^{-7} and OH^- ion of 10^{-7} moles per liter or a pH value of 7, which is the neutral point. If the pH value is above 7 the reaction is alkaline and below 7 it is acid. Both increase in alkalinity or acidity as the numbers decrease.

Hydrogen equivalent of a substance is the number of atoms which can be replaced by hydrogen in the molecule or the number of hydrogen atoms required to replace the atoms in the molecule.

Choke for Control of Velocity and No Relation to Normal Production

Oil wells are reported as a certain number of barrels on 1-in. choke. If these wells came in normal, what would be the initial production? What reduction does 1-in. choke cause? If there a formula or any method to obtain the initial production of wells that are completed through various size chokes?—C. T.

The choke is a device used in a gas well, oil well or gas and oil well for the control of velocity. When gas alone is being produced the daily capacity of different choke nipples, expressed in 1,000 cu. ft., varies as shown in the table from Diehl.

CAPACITIES OF CHOKE NIPPLES

Values are thousands of cubic feet in 24 hours, based on the following conditions: Base pressure, 14.64 lb. absolute; base and flowing temperature, 60° F.; specific gravity, 0.60

Upstream gage pressure, lb.	Downstream gage pressure, lb.	Diameter of choke in inches							
		0.125	0.188	0.250	0.313	0.375	0.500	0.625	0.750
500	100	179	414	739	1,204	1,753	3,228	5,148	7,475
400	100	144	333	612	1,412	2,601	2,601	4,141	6,022
300	50	109	253	464	736	1,071	1,973	3,147	4,569

The figures in the table are based upon the following:

$Q = CP_a/2$, when the downstream pressure, P_d, is less than one-half of the upstream pressure, P_a.

$Q = C\sqrt{P_d\ (P_a - P_d)}$, when the downstream pressure, P_d, is greater than 50 per cent and less than 80 per cent of the upstream pressure, P_a. This formula is not satisfactory in all cases when the downstream pressure, P_d, is greater than 80 per cent of the upstream pressure, P_a.

Q = quantity in cubic feet per day.

C = 24-hour coefficient for the following conditions: Base pressure, 14.65 lb. absolute (four ounces); base and flowing temperature, 60° F.; specific gravity, 0.60.

P_a = upstream or inlet pressure in pounds per square inch absolute.

P_d = downstream or outlet pressure in pounds per square inch absolute.

F. P. Donohue has explained that the flow of a well actuated by gas is mainly a problem in velocity, a certain minimum being necessary for the gas to carry the oil and if not obtained the oil drops back and the well heads or goes dead. Experiments of the Amerada Petroleum Corp. illustrate the idea. A well in Central Texas had been completed with 5⅜-in. casing at 500 bbl. per day. It declined to about 300 bbl., started heading and died. A string of 3-in. tubing was run and after a swab the well resumed steady flow. When the velocity at the bottom of the 3-in. approximated 5 ft. per second, heading again occurred and the well died. Then 2.5-in. tubing was set and the well flowed until the velocity approached 5 ft. per second. Then 2-in. and later 1.5-in. were run, the well finally dying in the 1.5-in. at 60 bbl. per day at a velocity of about 5 ft. per second.

The production of an oil well under a specified choke cannot be estimated for some other condition.

References: Diehl, Natural Gas Handbook, pp. 293, 302. F. P. Donohue, A.I.M.E. Trans. Petrol. Div. 1930, p. 226.

Questions on Petroleum Technology may be sent to Dr. Charles K. Francis, The Oil and Gas Journal, Tulsa, Okla. When a copy of the answer is desired, postage should be included.

WHAT GETS THE PROFIT in the Oil Business?

To the layman, every oil man is a millionaire. He has no problems that have to do with making ends meet. His is a business where the details take care of themselves.

But the oil man knows that too often something gets the profits—and what, is often a moot question. Taxes, interest, operating expenses and all like answers are plausible, but unsatisfactory.

It may be only a clue, but in experience that has to do with serving oil men in old and new fields through 75 stores handling Quality Products Only, we find that successful operators pay more than casual attention to the selection of equipment and its source. Undue depreciation, premature failure, the absence of dependable repair parts service—these are things that can be more serious than would seem possible on the surface.

FRICK-REID *Supply Corporation*

TULSA, OKLAHOMA

75 STORES AND 12 OFFICES IN OLD AND NEW FIELDS

Mid-Continent Refinery Crude Runs Increase in March

ESTIMATED daily crude runs for the entire Mid-Continent area are up 4,860 bbl. in March, compared with February. The total of 531,645 bbl. for the month is 34,465 bbl. over the total of 497,180 bbl. for the same period of last year. With the exception of Arkansas, East Texas and North Louisiana, all states in this area show considerable increases in daily crude runs to stills.

Kansas

Kansas lead all states with increased runs to stills of 7,660 bbl. daily. The total of the estimated crude runs is 137,100 bbl. per day, compared with 129,440 bbl. in February. Among those plants making notable increases in operations are: Bay Petroleum Co., McPherson; Derby Oil Co. at Wichita; El Dorado Refining Co., Eldorado; Phillips at Kansas City and Socony-Vacuum plant at Augusta, the latter reporting an increase of 2,000 bbl. daily. Other plants have made small increases in crude schedules or are maintaining their runs of the previous month.

North Louisiana and Arkansas

In the North Louisiana and Arkansas area some of the larger plants are decreasing their daily crude runs for the first time in several months. In North Louisiana the Arkansas Fuel Oil Co. plant at Bosier City cut back their daily schedule in March by 2,000 bbl., while in Arkansas the Lion Oil Refining Co. plant at El Dorado reports daily crude runs for March to be 10,000 bbl., compared with 16,500 bbl. in February. Total daily crude runs for Arkansas are estimated at 21,700 bbl., a reduction of 7,000 bbl. In North Louisiana the total of 38,950 bbl. is 1,750 bbl. under the total of last month.

East Texas

East Texas refiners have reduced their daily throughput by 2,170 bbl. compared with last month. Reductions were small and general throughout the area, as was reported last month. Two plants, however, report an upturn in operations. These are M. M. Travis, Inc., at Kilgore which has increased daily crude runs to stills from 2,100 bbl. in February to 2,500 bbl. in March, and the Premier Oil Refining Co. of Texas, from 2,900 bbl. last month to 3,000 bbl. in March. The Premier plant also reports an increase in capacity from 4,000 bbl. to 6,500 bbl. Total daily crude runs are estimated at 36,400 bbl. compared with 38,570 bbl. in February.

Oklahoma

In Oklahoma as in other states of the Mid-Continent area, motor fuel stocks have increased steadily but with prices strengthening in some areas and the promise of the spring pickup in motoring, several refiners have increased crude schedules, with a net increase of 1,990 bbl. for the month. No important changes have been reported, the added runs to stills aggregating from the entire area. Total estimated crude runs for Oklahoma are 158,600 bbl., compared with 156,610 bbl. in February.

North Central Texas

North Central Texas refiners have increased operations with a total of 38,945 bbl. being processed daily compared with 34,365 bbl. during February. The Taylor Refining Co. plant is not running steady but is reported to have run 600 bbl. daily during two 10-day periods out of 3 months.

West Texas and Panhandle

Daily crude runs in this area are slowly picking up, with 83,250 bbl. daily estimated for March, compared with the total of 82,050 bbl. in February. Moutray Oil Co. at Hawley reports a leading plant just completed.

Southwest Texas

Crude runs to stills in Southwest Texas are estimated at 16,700 bbl. daily during March, an increase of 350 bbl. over last month's total of 16,350 bbl.

Mid-Continent Crude Runs

Average Daily (Barrels)

(Advance estimate compiled by The Oil and Gas Journal)

	1938	1939	1940
January	529,710	503,405	532,085
February	507,985	494,910	526,785
March	491,935	497,180	531,645
April	532,120	523,535	.....
May	527,315	534,535	.....
June	540,005	541,090	.....
July	557,520	550,755	.....
August	554,810	556,095	.....
September	555,695	550,830	.....
October	531,325	547,725	.....
November	524,035	537,375	.....
December	503,530	527,230	.....

Operations by Refinery District

Daily crude runs	Mar.	Feb.	Incr.
Arkansas	21,700	28,700	*7,000
East Texas	36,400	38,570	*2,170
Kansas	137,100	129,440	7,660
N. Central Texas	38,945	34,365	4,580
North Louisiana	38,950	40,700	*1,750
Oklahoma	158,600	156,610	1,990
Southwest Texas	16,700	16,350	350
W. Texas Panhandle	83,250	82,050	1,200
Total	531,645	526,785	4,860

*Decrease.

Estimated Daily Average Mid-Continent Refinery Crude Runs for March

OKLAHOMA

Company and location—	Daily capacity	Av. dly runs Mar.	Av. dly runs Feb.
Anderson-Prichard Ref. Corp., Cyril	8,000	6,500	6,500
Barnsdall Ref. Corp., Barnsdall	5,000	4,000	3,500
Bell Oil & Gas Co., Granfield	5,000	2,500	2,500
Ben Franklin Ref. Co., Ardmore	5,000	4,000	4,000
Black Gold Ref. Co., Oklahoma City	2,500	2,000	2,000
Champlin Ref. Co., Enid	16,000	15,000	15,000
Cities Service Oil Co., Okmulgee	4,000	(*)	(*)
Cities Service Oil Co., Ponca City	12,000	10,000	10,000
Continental Oil Co., Ponca City	28,000	22,500	22,000
Cushing Ref. & Gasoline Co., Cushing	4,200	3,500	3,500
Deep Rock Oil Corp., Cushing	10,000	9,000	9,000
Johnson Oil Ref. Co., Cleveland	6,000	3,500	3,500
Mid-Continent Pet. Corp., West Tulsa	35,000	21,000	21,000
Ohio Oil Co., Bristow	5,000	2,500	2,500
Omar Ref. Co., Garber	5,000	(*)	(*)
Phillips Pet. Co., Okmulgee	6,000	5,600	5,860
Peppers Gasoline Co., Oklahoma City	500	400	400
Rock Island Ref. Co., Beckett	7,500	6,000	5,500
Sinclair Ref. Co., Sand Springs	6,000	5,600	5,600
Sun Oil Co., Yale	5,000	1,500	1,500
Sunray Oil Co., Allen	7,000	4,000	3,750
Texas Co., West Tulsa	16,000	15,000	15,000
Tide Water Oil Co., Drumright	12,000	10,000	10,000
Wilcox Ref. Division, Bristow	5,000	4,500	4,000
Total	215,700	158,600	156,610

*Shut down.

ARKANSAS

Company and location—	Daily capacity	Av. dly runs Mar.	Av. dly runs Feb.
Berry Asphalt Co., Waterloo	2,000	1,200	1,000
Henry H. Cross, Smackover	6,000	3,000	3,000
Lion Oil Ref. Co., El Dorado	17,000	10,000	16,500
Macmillan Pet. Corp., Norphlet	2,500	2,000	2,000
Root Ref. Co., El Dorado	10,000	5,300	6,000
Stephens Ref. Co., Stephens	700	200	200
Total	38,200	21,700	28,700

NORTH LOUISIANA

Company and location—	Daily capacity	Av. dly runs Mar.	Av. dly runs Feb.
Arkansas Fuel Oil Co., Bossier City	25,000	18,000	20,000
Atlas Pipe Line Co., Shreveport	12,500	6,000	6,000
Bayou State Oil Corp., Hosston	750	800	800
Pennant Ref. Co., Princeton	750	500	500
Premier Oil Ref. Co. of Texas, Cotton Valley	3,500	2,850	2,900
Rodessa Oil & Ref. Corp., Cedar Grove	12,000	8,500	8,500
Stanolind Oil & Gas Co., Superior	5,000	2,300	2,000
Texas Co., Shreveport	7,000	(*)	(*)
Total	66,500	38,950	40,700

*Shut down.

KANSAS

Company and location—	Daily capacity	Av. dly runs Mar.	Av. dly runs Feb.
Anco Ref. Co., Garnett	500	350	350
Barnsdall Ref. Co., Wichita	5,000	5,000	5,000
Bay Pet. Co., McPherson	4,000	2,500	2,000
Chanute Ref. Co., Chanute	1,000	600	600
Derby Oil Co., Wichita	8,000	7,000	6,000
El Dorado Ref. Co., Eldorado	5,000	4,000	3,500
Falcon Ref. Co., Inc., Great Bend	2,500	1,800	1,800
Globe Oil & Ref. Co., McPherson	15,000	15,000	15,000
Kanotex Ref. Co., Arkansas City	12,000	5,500	5,500
National Ref. Co., Coffeyville	8,000	4,200	4,000
Pet. Products Co., Chanute	1,250	1,000	1,000
Phillips Pet. Co., Kansas City	23,000	19,300	17,240
Roper Pet. Co., Parsons	750	150	150
Shallow Water Ref. Co., Scott City	2,000	1,500	1,500
Sinclair Ref. Co., Coffeyville	12,000	9,500	9,000
Sinclair Ref. Co., Argentine	11,000	9,200	9,000
Skelly Oil Co., Eldorado	23,000	20,500	20,000
Socony-Vacuum Oil Co., Inc., Augusta	23,000	20,000	18,000

Company and location—	Daily capacity	Av. dly. runs Mar.	Feb.
Standard Oil Co. (Indiana), Neodesha	7,500	7,000	7,000
Vickers Pet. Co., Potwin	4,000	3,000	3,000
Total	168,500	137,100	129,440

EAST TEXAS

Beacon Oil & Ref. Co., Henderson	4,500	(*)	(*)
Danciger Refs., Inc., Longview	6,000	(*)	(*)
East Texas Ref. Corp., Longview	6,000	3,500	3,500
Gladewater Ref. Co., Gladewater	3,000	2,000	2,200
Hurricane Pet. Corp., Overton	5,000	3,000	3,170
Hurricane Pet. Corp., Arp	3,300	(*)	(*)
Independent Ref. Co., Arp	3,500	2,000	2,200
Lynch Ref. Co., Kilgare	3,000	2,000	2,000
Magnolia Pet. Co., Corsicana	5,000	3,500	3,500
McMurrey Ref. Co., Tyler	10,000	2,400	4,500
Model Oil & Ref. Co., Kilgore	2,000	(*)	(*)
Premier Oil Ref. of Texas, Greggtown	6,500	3,000	2,900
Talco Asphalt & Ref. Co., Mount Pleasant	7,500	5,000	5,000
Texas Co., Dallas	16,000	7,500	7,500
Tower Ref. Co., Overton	3,500	(*)	(*)
Travis, M. M., Inc., Kilgore	4,000	2,500	2,100
Total	88,800	36,400	38,570

*Shut down.

NORTH CENTRAL TEXAS

Baird Refining Co., Baird	1,500	900	900
Bryson Pipe Line & Refining Co., Bryson	2,000	1,000	1,000
Bryson Ref. Co., Inc., Bryson	1,500	(*)	(*)
Coleman Ref. Co., Coleman	1,000	400	400
Continental Oil Co., Wichita Falls	6,000	6,000	5,600
Cosden Pet. Corp., Graham	2,000	1,200	1,000
Falls Ref. Co., Wichita Falls	2,500	400	400
Gratex Ref. Co., Graham	500	300	300
Gulf Oil Corp., Fort Worth	8,000	6,500	6,000
Hightower Oil & Ref. Corp., Brownwood	750	(*)	(*)
Jacksboro Ref. Co., Jacksboro	400	100	100
La Salle Pet. Corp., Burkburnett	3,500	1,200	1,000
Magnolia Pet. Co., Fort Worth	7,500	5,500	5,500
Muenster Ref. Co., Muenster	1,800	800	600
North Texas Ref. Co., Gainesville	1,000	600	600
Ohio Oil Co., Fort Worth	5,000	3,700	3,500
Olney Oil & Ref. Co., North Olney	3,500	1,200	1,000
Panhandle Ref. Co., Wichita Falls	4,200	2,500	2,000
Panhandle Ref. Co., Lueders	1,500	875	800
Southland Ref. Co., Olney	500	200	200
Taylor Ref. Co., Taylor	1,000	600	600
Texas Pacific Coal & Oil Co., Caddo	800	450	450
Tucker Oil Co., Burkburnett	250	20	15
Tydal Ref. Co., Gainesville	2,000	(*)	(*)
W. T. Waggoner est., Vernon	5,000	4,500	2,400
Total	62,700	38,945	34,365

*Shut down.

SOUTHWEST TEXAS

Border Oil & Ref. Co., Sullivan City	1,000	500	400
Eggleston Oil Products Co., Three Rivers	1,000	750	700
Humble Oil & Ref. Co., San Antonio	5,000	3,500	3,500
Magnolia Pet. Co., Luling	8,000	4,600	4,500
Pettus Oil & Ref. Co., Pettus	1,000	950	900
Phoenix Ref. Co., San Antonio	2,000	1,000	1,000
Phoenix Ref. Co., Pettus	900	650	650
Pioneer Oil & Ref. Co., Somerset	2,000	750	750
Rado Ref. & Prod. Co., McAllen	800	450	450
Texas Co., San Antonio	5,000	3,550	3,500
Total	26,700	16,700	16,350

WEST TEXAS AND PANHANDLE

Aero Gas & Ref. Co., Fort Stockton	350	100	100
Coltex Ref. Co., Colorado	12,500	8,000	8,000
Cosden Oil Co., Big Spring	12,500	10,000	10,000
Danciger Refs., Inc., Pampa	6,500	5,000	4,800
Danube Oil Corp., Borger	800	400	400
Petrol Ref. Co., Lubbock	500	(*)	(*)
Gulf Oil Corp., Sweetwater	7,000	6,200	6,000
Howard County Ref. Co., Big Spring	2,000	600	600
Motor Fuels Corp., Levelland	4,000	3,000	3,000
Moutray Oil Co., Hawley	1,200	950	900
Onyx Ref. Corp., Hawley	3,000	1,800	1,800
Payward Ref. Co., Shamrock	600	500	450
Phillips Pet. Co., Borger	35,000	27,100	26,900
Post Refining Co., Rotan	800	350	350
Shamrock Oil & Gas Corp., Sunray	3,000	1,500	1,500
Stamford Ref. Co., Stamford	450	300	350
Shamrock Oil & Gas Corp., Lefors	1,600	850	800
Standard Oil Co. of Texas, El Paso	14,000	9,000	8,500
Star Light Ref. Co., Ballinger	1,000	500	500
Texas Co., El Paso	2,000	1,500	1,500
Texas Co., Amarillo	6,000	4,000	4,000
Western Ref. Co., Fort Stockton	1,000	800	800
Wickett Pet. Co., Wickett	3,500	800	800
Total	119,300	83,250	82,050

*Shut down.

Decision on Gasoline Tax Not to Be Reconsidered

WASHINGTON, D. C.—Despite pleas by Arkansas, New Hampshire, and Nevada, the Supreme Court refused to reconsider its February 12 decision enjoining Arkansas from imposing a tax on gasoline (in excess of 20 gal.) carried in the fuel tanks of interstate buses if the gasoline was for use in another state.

In petitioning for a rehearing of the 5 to 3 decision, Arkansas officials contended the opinion "overlooks the practical necessities of at least 15 states in the enforcement of gasoline-tax laws and the practical needs of motor carriers."

Real Competition in Oil, Says Holland

WASHINGTON, D. C.—George W. Holland, director of the Petroleum Conservation Division, told the House appropriations committee he believed there is real competition in the oil industry. "The company that produces gasoline is interested in gallonage and will do anything to get it."

Consumption of Asphalt Attains New Record

NEW YORK.—Consumption of asphalt in this country in 1939 has been semiofficially placed at 6,192,000 tons by A. M. Maxwell, manager of the asphalt department of Standard Oil Co. of Ohio and vice president of the Asphalt Institute. Mr. Maxwell's report issued in New York last week stated that domestic consumption for the past year established a new high record and that it was 7 per cent above the 1938 figure. Of the total consumption approximately 75 per cent went into highways, about 20 per cent into building construction and the balance in miscellaneous uses.

Joseph S. Helm, manager of the asphalt department of Standard Oil Co. of New Jersey, has been reelected president of the Asphalt Institute for the fiscal year beginning April 1.

Just What Every Refinery Needs to Save on Its Pipe Expansion Problems . . . . . .

BADGER *Stainless Steel* EXPANSION JOINTS

. . . problems involving the higher temperatures so common throughout the refinery.

Why are these expansion joints ideal for this purpose? For one thing, they're packless thus requiring no maintenance. They're very compact and save on space and insulation over bends. Being of stainless steel, they are able to function properly as a corrugated type of expansion joint and at the same time withstand the severe conditions common with most refinery pipe expansion problems.

That they are made by the same company that makes the widely-used BADGER Directed Flexing Copper Expansion Joint is added assurance that they are made right and are suitable for the job.

A typical use of the BADGER Non-Equalizing Expansion Joint is connecting a turbine with its exhaust. This type of expansion joint is ideal for absorbing limited vibrations, expansion, and displacements between adjacent equipment, as well as limited expansion and contraction under low pressures in pipe lines.

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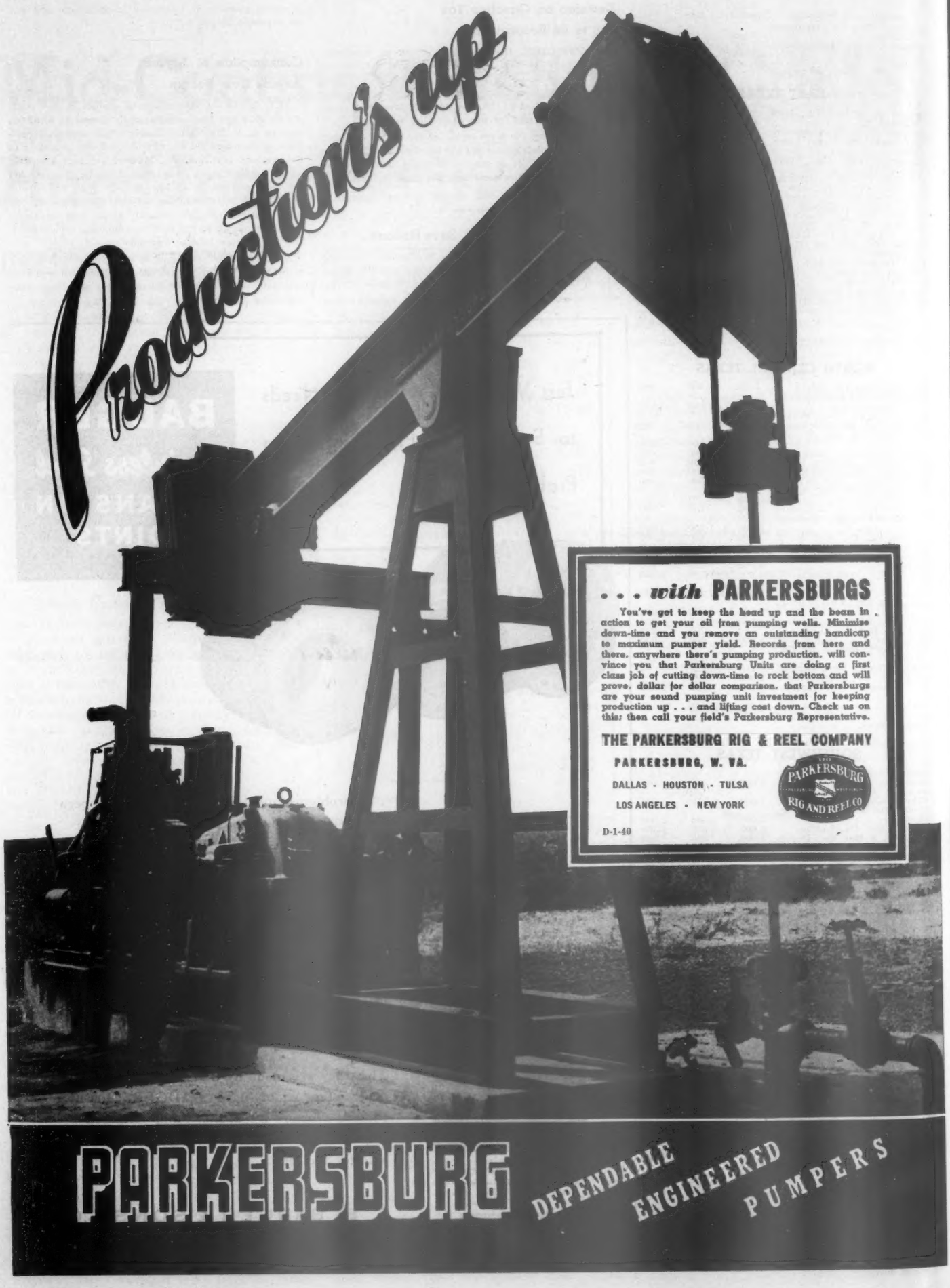
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FIELD OPERATIONS

Summarizing the Week's Developments

ILLINOIS—A new production peak of 455,755 bbl. per day was reached in Illinois in the past week. Twenty-two Devonian lime wells were completed in the Salem field in Marion County, with actual initial production, in 3-hour to 24-hour flows, of 40,987 bbl. A new pool was assured Jasper County and another pool in Edwards County appeared probable.

OKLAHOMA—The Marshall County discovery well was deepened to second Tulip Creek sand where it flowed 60 bbl. of oil an hour through a choke on a drill-stem test. The new area has been named the Cumberland pool. The gas discovery well in Kingfisher County, first producer in that county, was to be deepened 1,000 ft. to second Wilcox sand. Sixth producer in the West Weleetka pool, Okfuskee County, flowed 1,695 bbl. of 41-gravity oil in 15 hours.

KANSAS—The Stoltenberg pool in Ellsworth County was extended in three directions and much productive acreage was added to the field. Wells of large potentials were completed in several fields but were limited in production by stringent proration rules.

TEXAS: Gulf Coast—New pay sands and extensions marked the district but a new pool was in prospect in the Double Gum area in Liberty County. The Anahuac and Anchor fields were given substantial extensions.

Southwest Texas—The work of exploring the Jackson shore-line trend in search of Tertiary Wilcox production is not proceeding encouragingly, Wilcox sand showings in four current tests do not point to new pools.

West Texas—A new outpost location to the Slaughter field has been staked to extend exploration southward into Terry County.

West Central Texas—Completions and new operations, together with several lease deals, have greatly increased the activity in the Stribling field of Stephens County.

North Texas—Following the completion of the two deep oil-field discoveries leasing and blocking in Montague County has reached a new high with tracts ranging in prices from $10 per acre to $100 per acre.

Eastern Texas—A new Paluxy sand wildcat will be drilled in Hopkins County to further add to the district's Trinity series exploratory campaign.

ARK-LA-TEX—A favorable drill-stem test of oil in the Paluxy horizon, following a show of oil in the Blossom sand, added to the interest in a Miller County, Arkansas, wildcat and touched off a leasing campaign along the trend of a graben on which the test is drilling. In La Salle Parish, North Louisiana, a wildcat showing possibility of oil tested salt water, gas, and a slight trace of oil. In the coastal district a new pool is in prospect in La Fourche Parish.

CALIFORNIA—Continental Oil Co.'s deep well in the Wasco field in Kern County flowed 2,205 bbl. It is bottomed at 13,157 ft.

WYOMING—Three completions in Lance Creek aggregated 630 bbl. per hour in production, or at the average rate of about 5,000 bbl. per day per well. A new Tensleep sand pool was opened in Carbon County, the first discovery of the year.

Completions in All Fields

(Week Ended March 16, 1940)

	Oil	Gas	Dry	Total	comp. to date 1940 total	comp. to date 1939 total
N. Y., Pa., and W. Va.	54	19	7	80	817	707
Ohio	8	8	7	23	200	191
Indiana	3	0	2	5	71	29
Kentucky	2	0	1	3	79	117
Illinois	57	2	3	62	716	723
Michigan	10	1	14	25	287	229
Kansas	18	2	1	21	295	231
Oklahoma	10	1	10	21	356	369
Texas:						
North Central Texas	39	4	36	79	686	450
West Texas	38	1	2	41	498	399
Texas Panhandle	4	0	0	4	129	78
East Texas	5	0	0	5	63	164
East Central Texas	2	0	1	3	56	49
East Texas Border	0	0	0	0	10	19
Gulf Coast Texas	20	1	4	25	284	271
Southwest Texas	21	2	19	42	490	473
Total Texas	129	8	62	199	2,216	1,903
North Louisiana	10	3	2	15	121	101
Gulf Coast Louisiana	9	0	3	12	164	131
Total Louisiana	19	3	5	27	285	232
Arkansas	2	0	2	4	49	57
Montana	2	0	0	2	30	23
Wyoming	6	0	0	6	35	22
Colorado	0	0	0	0	5	3
New Mexico	3	1	0	4	160	128
California	14	1	3	18	225	193
Total United States	337	46	117	500	5,826	5,157
Total previous week	367	39	115	521		
Week ended Mar. 18, 1939	290	40	78	408		

Outstanding Fields—Highlights

(Week Ended March 16, 1940)

FIELD—	Rigs up	Wells drlg.	Weekly oil completions	Initial prod.	Total No. oil wells	Daily av. prod.
TEXAS						
K.M.A.	26	35	5	3,947	1,284	44,249
Wasson-Bennett	14	70	13	13,777	703	31,480
Ector County	12	66	11	8,083	2,023	55,950
Pecos County	4	18	1	158	1,248	36,400
Jones County	7	18	3	569	598	8,300
East Texas	10	14	5	273	25,990	397,000
OKLAHOMA						
St. Louis	4	26	0	0	872	32,300
Cement	4	25	0	0	295	6,520
KANSAS						
Bemis	2	6	1	15	277	6,950
Burnett	3	10	2	700	73	3,230
Silica	1	9	1	197	609	15,300
Trapp	1	12	0	0	495	14,500
NEW MEXICO						
Lea County	12	53	1	69	2,398	96,810
Eddy County	17	63	1	240	531	16,140
LA-ARK-TEX						
Cotton Valley, La. (deep)	1	5	0	0	154	14,515
Magnolia, Ark.	0	5	1	745	98	20,070
Golden Meadow, La.	2	11	3	842	64	8,190
MICHIGAN						
Freeman-Redding	2	11	1	45	145	13,887
Kent County	4	30	3	385	285	18,560
CALIFORNIA						
Montebello	1	12	1	405	357	20,187
ILLINOIS						
Salem	18	126	25	41,414	1,749	291,024
Louden	4	30	7	1,118	1,366	75,186
Other fields	66	244	25	3,310	3,531	79,912
Old fields	....	.....	...	.....	.....	9,633
MISSISSIPPI						
Tinsley	3	10	1	480	27	8,800

North Louisiana, Arkansas

Miller County Test Has Had Oil Showings in 2 Horizons

By
GEORGE WEBER

SHREVEPORT, La., Mar. 16.—Discovery of commercial oil production in a Miller County wildcat in Southern Arkansas added to the importance of that area. Following a show of oil in an upper formation, the wildcat tested oil in the Paluxy formation, making Southwest Arkansas the week's most interesting section of the tristate district. A small show of oil in a La Salle Parish, Louisiana, wildcat, gained only minor attention. A deep Columbia County wildcat is drilling for the Smackover lime, a second wildcat test is beginning in Lafayette County, and the newly opened Travis Peak production in Union County east of El Dorado is due for further drilling.

Production by Pool

Estimated daily gross production of all companies for week ended March 15:

NORTH LOUISIANA

	Bbl.
Bellevue	470
Caddo light	5,055
Caddo heavy	2,140
Converse	565
Cotton Valley	*14,515
Cross Lake	5,015
De Soto and Red River	955
Elm Grove	275
Haynesville	2,745
Holly	55
Homer	2,740
Lisbon	4,280
Pleasant Hill	110
Rodessa	21,815
Sarepta-Carterville	†310
Sligo	1,865
Sugar Creek	570
Urania	2,085
Zwolle	2,040
Total	67,605

SOUTH ARKANSAS

Atlanta	910
Big Creek	Closed in
Buckner	2,385
Champagnolle	1,240
Dorcheat	1,245
El Dorado	1,630
Lewisville	750
Lisbon	215
Magnolia	20,070
Miller County	250
Nevada	550
Nick Springs	175
Rodessa	2,130
Schuler	18,790
Smackover light	1,725
Smackover heavy	13,600
Stephens	525
Troy	1,335
Urbana	910
Village	1,315
Total	69,750

*4,225 bbl. is distillate.
†85 bbl. is distillate.
Texas side of Rodessa, 24,005 bbl.

Miller County Strike

The Standard Oil Co. of Louisiana's No. 1 Sturgis, C NW SE Section 1-17-27, near Fouke, Miller County, Arkansas, is drilling for the Glen Rose formation after two oil showings in upper sands. Following a test of the Blossom sand at 2,896-2,931 ft., which recovered 180 ft. of oil-cut mud and 90 ft. of mud in 30 minutes, with ¾-in. chokes top and bottom, the test was deepened.

A sand showing oil was drilled at 3,585-90 ft., and a core taken at 3,590-3,600 ft. developed 9½ ft. of saturated oil sand. A drill-stem test was made at 3,584-3,600 ft., and in 25 minutes, using ¾-in. chokes top and bottom, the test developed 2,700 ft. of 32.8-gravity oil and gas but no water. The core from 3,600-10 ft. showed the base of the sand at 3,606 ft.

A further indication of oil was found still deeper, when a core taken at 3,673-80 ft. showed shale with streaks of oil sand. The wildcat is coring ahead for the Glen Rose formation.

The prospective field is about 10 miles southwest of the Garland City field, an old Paluxy sand pool, which has shown a recovery of about 6,000 bbl. to the acre from a sand body not considered as good as the one discovered in the current wildcat. This possibility for good recovery of "shallow" production, requiring much less drilling investment than the Smackover lime production, enhances the Standard discovery.

Although acreage in the vicinity of the well is closely held, considerable trading has resulted from the discovery. The trend of a well-known graben, extending slightly north of east to the Stamps area, and southwest into Cass County, Texas, from the wildcat, is receiving a very active play.

A north outpost has already been staked by Hassie Hunt for his No. 1 Holman, SE SE SW, Section 36-16-27, ¾ mile northwest of the wildcat, and the Standard Oil Co. is reported planning another test shortly.

South Arkansas Wildcats

In Columbia County James Forgotson's No. 1 L. M. Dendy, about 3 miles southeast of the Village field, and in Section 24-17-19, is drilling below 3,700 ft. for the Smackover lime. A new Smackover wildcat in Lafayette County, Atlantic Refining Co.'s No. 1 Bodcaw in Section 29-16-23, southwest of Buckner, is being staked.

In the new Travis Peak producing area east of El Dorado, recently brought in by Delta Drilling Co., Fohs Oil Co. and Barnsdall Oil Co. are planning tests. In Arkansas County, Fohs Oil Co.'s J. M. Hazelwood and others are drilling below 4,360 ft. on a core test.

La Salle Parish Test

North Louisiana remained quiet during the past week, with but one wildcat of interest. Placid Oil Co.'s No. 9 Louisiana Central Lumber Co., Section 13-10-2e, east of Urania, tested 3,000,000 cu. ft. of gas and 600 bbl. of salt water, with a slight showing of oil, through a ¾-in. choke. Tubing pressure was 200 lb. The showing of oil was logged at 2,397-2,409 ft. The crew set 5½-in. casing at 2,396 ft. In an offset position, Hunt Oil Co. and Arkansas Fuel Oil Co.'s No. 1 Goodpine, a deep test, drilled below 8,820 ft. with no showing to date, excepting a gas showing in the horizon corresponding to that tested in the Hunt wildcat last week.

NORTH LOUISIANA COMPLETIONS

Sligo—Bossier Parish

Triangle Drilling Co.'s No. 5-A Skannal, 2,001 ft. east and 665 ft. north of SW cor. Section 13-17-12, flowing by heads, 200 bbl. a day, through 1-in. choke. Set 5½-in. casing at 3,118 ft., total depth 3,145 ft. It had been acidized with 5,000 gal.

Caddo—Caddo Parish

J. W. Bailey's No. 1 Gibbs, Section 7-20-15, pumping 40 bbl. after acidizing with 3,000 gal., total depth 1,535 ft. D. L. Butler's No. 1 Browning, Section 28-22-16, dry and abandoned at 2,743 ft. Murray Samuels' No. 1 Howard, Section 1-20-16, pumping 50 bbl., total depth 1,480 ft. Southern Oil Co.'s No. 2 Muslow, Section 5-21-15, pumping 35 bbl., total depth 1,556 ft. Stanolind Oil & Gas Co.'s No. 1 Lane, Section 25-21-15, flowing 5 bbl., ¼-in. choke, casing pressure 200 lb., total depth 1,569 ft. Stanolind Oil & Gas Co.'s No. 13 Slattery, Section 21-21-15, pumping 12 bbl., total depth 1,593 ft. H. J. Streif's No. 2 Noel estate, Section 12-20-16, pumping 45 bbl., total depth 1,540 ft. Texas Co.'s No. 2 Guyfee, Section 1-20-16, pumping 25 bbl., total depth 1,510 ft.

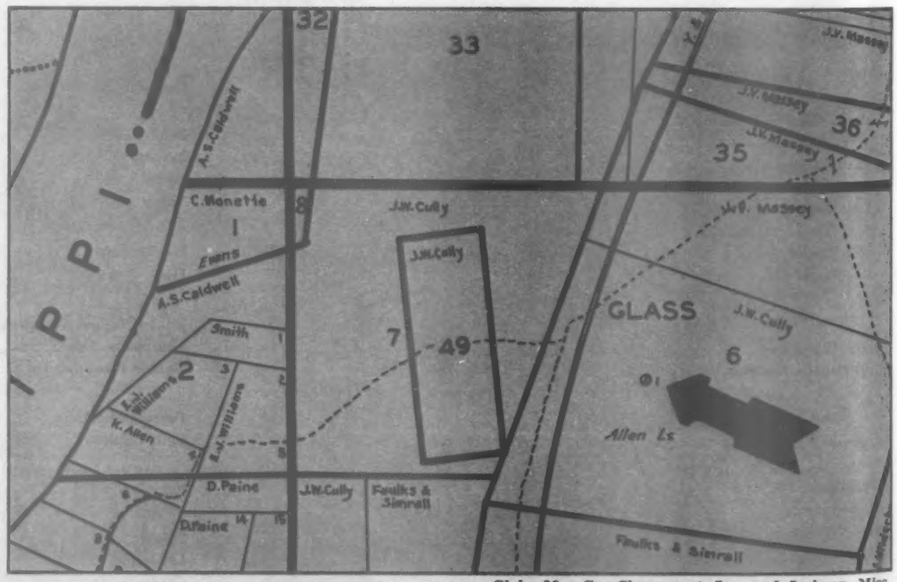
Shreveport—Caddo Parish

R. Manziel's No. 1 City of Shreveport, 660 ft. NW cor. SW Section 35-18-14, 456 bbl., 1-in. choke, casing pressure 500 lb., tubing pressure 100 lb., total depth 5,577 ft.

Monroe—Morehouse Parish

Southern Carbon Co.'s No. 27 Tensas, Section 2-21-4, 1,500,000 cu. ft. gas, rock pressure 893 ft., total depth 2,225 ft.

(Continued on Page 100)



Globe Map Co., Shreveport, La., and Jackson, Miss.

The Glass dome of west Warren County, south of Vicksburg Miss., near the river, is the scene of an interesting active wildcat, W. O. Allen's No. 1 J. W. Cully. The Glass prospect was first indicated from geology in the same type of survey which first brought to light the Tinsley structure to the north in Yazoo County

Illinois, Indiana and Kentucky

By STAFF CORRESPONDENT

Illinois Produced 455,755 Bbl. Per Day in Past Week

CENTRALIA, Ill., Mar. 19.—Illinois crude-oil production increased nearly 40,000 bbl. per day in the past week, averaging a daily output of 455,755 bbl., making a new record and reviving the hope of those who have been prophesying a 500,000-bbl. daily production for the state. The new peak makes Illinois currently the third producing state in the union, surpassed only by Texas and California.

The U. S. Bureau of Mines' latest figures on Illinois production are for January. In that month the bureau credits the state with an average production of 370,900 bbl. per day. In January 1939 the bureau gives the daily average production as 143,428 bbl., and in January 1938, as 36,389 bbl. As evidence of the recent rapid rise in production it may be cited that in the 31 days ending with March 16 of this year the average production of Illinois has been 420,764 bbl. per day based on The Oil and Gas Journal's weekly production figures.

Carter Oil Co.'s No. 1 James Seaman, 2 miles south of Mattoon, and on a large structure, lost the bit in the hole at about 3,530 ft. It had been drilling below 3,550 ft., headed for the Trenton rock after passing through dry Devonian lime. The test had showings of oil in upper horizons, but thus far has been a disappointment.

Morrison & Noah may open a pool in Edwards County with their No. 1 Barnes, SE NE NE Section 24-2s-10e. It had 400 ft. of fluid in the hole after a drill-stem test in McClosky lime at 3,128-3,217 ft., total depth 3,240 ft. It is about 5 miles from any production.

In Jasper County Pure Oil Co.'s No. 1 Warren Consolidated, C E½ NE NW Section 33-6n-10e, which was reported last week to have opened a pool, on the strength of a drill-stem test, flowed naturally 268 bbl. of oil in 16½ hours through a 1-in. choke. The crew continued testing. It had Ste. Genevieve lime at 2,777 ft., Rosiclare lime at 2,790 ft., Fredonia lime at 2,810 ft., and pay at 2,822-28 ft., total depth 2,848 ft. Five and one-half-inch casing was set at 2,800 ft. Mammoth Producing & Refining Co.'s No. 2 Johnoff, SE SE SE Section 24-5n-9e, was rigging up rotary.

Salem Devonian Tests

During the week 25 operations were started for the Devonian in Townships 2n-2e and 1n-2e, Salem field. Texas Co. started 17 Devonian tests; Magnolia Petroleum Co., 5; Absher & Booth, 1; Kingwood Oil Co. and Bell, 1, and W. C. McBride, Inc., 1.

Near completions in the Salem field increased. Ohio Oil Co.'s No. 20 M. J. Young, NE NE NW Section 29-2n-2e, total depth 3,426 ft., acidized with 5,000 gal., and flowed 404 bbl. of oil in 2½ hours. Shell Oil Co., Inc.'s No. 6-C Young heirs, NE cor. NW NE SE Section 20-2n-2e, acidized with 2,000 gal., swabbed and flowed 114 bbl. in 24 hours, and Shell's No. 1-C Salem State Bank, NE NW SE Section 20-2n-2e, flowed 90 bbl. per day at a total depth of 3,421 ft. Magnolia Petroleum Co.'s No. 33 W. B. Young, in SE SW NE. Section 20-2n-2e, flowed 80 bbl. per day naturally at a total depth of 3,427 ft. Magnolia's No. 93 J. H. Young, Section 20, swabbed 291 bbl. in 24 hours, total depth 3,441 ft., and No. 92 Young, SE NE SE Section 20, after an acid treatment, flowed 108 bbl., total depth 3,451 ft. Magnolia's No. 85 J. H. Young, NW cor. NE NE SE Section 20-2n-2e, pay at 3,427-52 ft., acidized with 5,000 gal., flowed 120 bbl. in 8 hours and then died. W. R. Curry's No. 9 Young strip, SE SE SE Section 20-2n-2e, swabbed 7 bbl. per hour after an acid treatment of 7,500 gal., total depth 3,416 ft.

In the Centralia townsite field Menhall and others' No. 1-A I.C.R.R., total depth 2,909½ ft., swabbed 187 bbl. a day with some water from the Devonian. Bert Fields' No. 8 M.&I.R.R., flowed 78 bbl. an hour after an acid treatment in Devonian pay.

Exploration of Township 1n-2e, the southern part of the Salem field, for Devonian lime production began in earnest in the past week with the following operations reported: Texas Co.'s No. 28 V. Kalkbrenner, 1,111 ft. from south and 401 ft. from east lines of SW Section 5; Texas Co.'s No. 27 O. Johnson, 1,111 ft. from south and 411 ft. from east lines of SW Section 5; Texas Co.'s No. 6 Reid A, 355 ft. from south and 330 ft. from west lines of NE NW Section 5; W. C. McBride, Inc.'s No. 7 Fike heirs, 866 ft. from south and 98 ft. from west lines of SE Section 5, an old Aux Vases sand well drilling deeper.

62 New Oil Wells

Only 62 wells were completed in the state in the course of the week of which 57 were oil wells with an initial production of 45,842 bbl., based on their actual initial flow of 24 hours or less; 3 dry holes and 2 gas wells. The dry holes were one each in Fayette, Marion and Clay counties; the two gas wells were in Lawrence and White counties. Clark County had one 4-bbl. well; the Louden field in Fayette County, 7 new oil wells with 1,118 bbl. new production; St. James pool, 5 oil wells and 585 bbl. initial output; Richland County, 3 wells, 296 bbl.; Salem field in Marion County, 25 new oil wells and 41,414 bbl. actual initial production, 22 of these having been Devonian lime wells with an actual initial of 40,798 bbl. Clay County, 2 oil wells, 410 bbl.; Wayne County, one 90-bbl. well; Wabash, 2 for 185 bbl. and White, 11 new ones with 1,740 bbl. initial output.

The Edwards County test of Noah & Morrison, on the Houston Barnes farm, in SE NE NE Section 24-2s-10e, 6 miles from the nearest production, is expected to open a pool. The hole was at a total depth of 3,240 ft., having found saturation in the McClosky lime below 3,130 ft. Casing was set on bottom, and perforations were to be made in the casing to test 6 ft. of McClosky pay that looked to be oil bearing. It is said the well also had good saturation in the Waltersburg sand.

The Dundas field shows the first Aux Vases sand pay in Richland County in Pure Oil Co.'s No. 5 Coen, in Section 36-5n-9e. The well produced 50 bbl. a day. Sand record was not yet available and the well was not a completion.

The Sandoval field in Marion County, one of the early-day productive spots, which last year was found to produce from the Devonian, is to have a Trenton lime test to be drilled by Mizner and others in Section 4-2n-1e. It failed to make a producer in the Devonian and will be deepened. Trenton lime is expected to appear at about 4,000 ft.

Production by District

The Salem pool in Marion County produced an average of 291,024 bbl. a day in the week ended Saturday, March 16; the Louden pool in Fayette County 75,186 bbl. and other basin fields 79,912 bbl. The old fields produced an average of 9,633 bbl., making a total production of 455,755 bbl. per day. Speculation as to the probable peak which production will reach this year ranges all the way from last week's figure up to 500,000 bbl. per day. Within 90 days all the present pipe-line building and looping of lines will have been completed and there will be outlets for all the oil that Illinois can produce and it is expected that the actual demand for Illinois crude will be limited only by the state's ability to supply it.

Fayette County

In Fayette County Carter Oil Co.'s No. 1 Minnie Doty, NE SE NW Section 2-8n-3e, Louden field, shot with 20 qt. in Cypress sand at 1,519-25 ft. and swabbed 246 bbl. per day. Paint Creek sand had first been shot at 1,574-87 ft., with no results. Carter's No. 1 Sinclair-Huffman, NW NE NE Section 2-8n-3e, was shot with 10 and 7 qt. in Cypress sand topped at 1,519-57 ft. and pumped 40 bbl. per day. Carter's No. 3 Jack Smith, NE NW NW Section 12-8n-3e, shot with 20 qt. at 1,522-28 ft., Cypress sand, swabbed 198 bbl. Carter's No. 2 Levi Tipsword, SE SW NW Section 22-8n-3e, shot with 40 and 10 qt. in Bethel sand at 1,478-1,505 ft., flowed 216 bbl. Carter's No. 1 Weaber-Horn, NW NE NW Section 28-8n-3e, shot with 30 and 20 qt., in Bethel sand at 1,472 ft., total depth 1,525 ft., swabbed 198 bbl. of oil and made 50,000 cu. ft. of gas. Carter Oil Co.'s No. 3 Pearl McClain, NE SE SE Section 32-8n-3e, plugged and abandoned at 1,597 ft. Shell Oil Co., Inc.'s No. 6 Jedamski, NE SE SW Section 21-7n-3e, shot with 21 qt. in Cypress sand at 1,557-83 ft., pumped 108 bbl. Texas Co.'s No. 3 Wantland, NW NW SE Section 31-7n-3e, shot with 10 qt. at 1,583-88 ft., pumped 112 bbl.

In the St. James pool in Fayette County, Ohio Oil Co.'s No. 2 A. E. Schwarm and others, SW SE SW Section 30-6n-3e, shot with 7 qt. in Cypress sand at 1,589-1,606 ft., pumped 100 bbl. the first day and 140 bbl. the second day. Ohio's No. 3 Schwarm and others, NW SE SW Section 30, pumped 18 bbl. a day from Cypress sand at 1,590-1,602 ft. It had not been shot. Texas Co.'s No. 2 Wright, NW NE NW Section 31-6n-3e, Cypress sand at 1,606-10 ft., pumped 189 bbl. a day; not shot. Texas Co.'s No. 9 M. J. Griffith, NW SE NE Section 25-6n-2e, Cypress sand at 1,568-82 ft., pumped 182 bbl. a day; not shot. Ohio Oil Co.'s No. 2 H. F. Peters, SE NE NW Section 36-6n-2e, shot with 6 qt. at 1,604-11 ft., Cypress sand, pumped 96 bbl. in 22 hours.

In Richland County Pure Oil Co.'s No. 2 Cook, NW NW SW Section 24-4n-9e, shot with 20 qt. in Cypress sand at 2,592-96 ft., pumped 11 bbl. Pure's No. 6 G. B. Murray, C E½ NE NW Section 6-4n-10e, McClosky pay at 2,811-18 ft., flowed 143 bbl. naturally. Pure's No. 4 Pflaum, NW NE NE Section 5-3n-9e, Cypress pay at 2,883-93 ft., pumped 142 bbl. of oil and 8 bbl. of water.

In Lawrence County Bowman's No. 1 Shaw-Gray, C NE SE Section 13-4n-11w, Buchanan sand 1,048 ft., total depth 1,075 ft., 24,500,000 cu. ft. of gas.

In Clark County F. D. Strickler's No. 1 McFarland, NW NE SW Section 19-10n-13w, total depth 2,833 ft., was plugged back to 2,820 ft. and pumped about 4 bbl. of oil and 12 bbl. of water in 24 hours. This well had top of the St. Louis lime at 496 ft., Devonian lime at 1,544 ft., and Trenton lime at 2,683 ft.

Marion County

In the Fairman pool in Marion-Clinton counties, Jones and Adams' No. 1 Adams, was dry and abandoned at 1,501 ft. Benoist sand was penetrated at 1,483-86 ft.

In the Salem field 22 Devonian lime wells were completed with actual initial production of 40,798 bbl. W. S. Curry's No. 6 Young strip, NW cor. NE NE SE Section 20-2n-2e, acidized with 5,000 gal., swabbed 240 bbl. in 24 hours. Devonian section not ascertained. W. R. Curry's No. 8 Young strip, CWL NE SE SE Section 20, 5,000 gal. of acid, swabbed an estimated 240 bbl.; Devonian section not learned. D. & H. Drilling Co.'s No. 1 Young strip, NW cor. NE SE SE Section 20, 3,000 gal. of acid, flowed 206 bbl.; Devonian section not learned. D. & H. Drilling Co.'s No. 3 Young strip, NE SE SE Section 20, acidized with 3,000 gal., flowed 250 bbl.; Devonian section not learned.

Magnolia Petroleum Co.'s No. 34 W. B. Young, SE cor. SW NE Section 20-2n-2e, Devonian pay at 3,392-3,412 ft., acidized with 5,000 gal., pumped 175 bbl. Ohio Oil Co.'s No. 34 M. Young heirs, NE SE SW Section 20, Devonian pay at 3,392-3,418 ft., acidized with 5,000 gal., flowed 1,450 bbl. Texas Co.'s No. 22 N. Young, CSL SE NE Section 20, Devonian pay at 3,390-3,435 ft., acidized with 3,000 gal., flowed 175 bbl. Tamberlin abandoned the location for No. 6 Young heirs strip, h

SE NE SE Section 20. Magnolia Petroleum Co.'s No. 81 J. H. Young, NW NW NW Section 28-2n-2e, Devonian pay at 3,423-45 ft., 5,000 gal. of acid, flowed 4,137 bbl. Magnolia's No. 84 J. H. Young, NW SW NW Section 28-2n-2e, pay at 3,430-55 ft., 5,000 gal. of acid, 1,724 bbl. Magnolia's No. 91 J. H. Young, SW NW NW Section 28-2n-2e, pay at 3,411-27 ft., 5,000 gal. of acid, flowed 2,877 bbl. Texas Co.'s No. 24 N. Lee, NW SW SW Section 28-2n-2e, pay at 3,390-3,425 ft., 5,000 gal. of acid, flowed 1,855 bbl. Magnolia Petroleum Co.'s No. 24 J. R. Young, NW SW NE Section 29-2n-2e, pay at 3,396-3,417 ft., 5,000 gal. of acid, flowed 1,725 bbl. Ohio's No. 38 M. Young heirs, SW SE NW Section 29-2n-2e, pay at 3,386-3,430 ft., 5,000 gal. of acid, flowed 2,340 bbl. The well had flowed 1,856 bbl. naturally.

Texas Co. and Brooks' No. 1 Brooks Community, NW NE SW Section 29-2n-2e, pay at 3,366-3,406 ft., 5,000 gal. of acid, flowed 4,200 bbl. Texas' No. 20 A. McCollum, NE SE SE Section 29-2n-2e, pay at 3,380-3,420 ft., flowed 3,920 bbl. Texas' No. 23 A. McCollum, SE SE SE Section 29-2n-2e, pay at 3,371-3,403 ft., flowed 60 bbl. an hour naturally; acidized with 5,000 gal., flowed 1,785 bbl. through casing and tubing. Shell Oil Co., Inc.'s No. 8-C E. T. Farthing, SE SW NE Section 32-2n-2e, pay at 3,432-52 ft., 5,000 gal. of acid, flowed 2,880 bbl. Texas Co.'s No. 19 Friesner, NW NE NW Section 32-2n-2e, pay at 3,313-50 ft., 5,000 gal. of acid, flowed 3,000 bbl. through casing and tubing. Texas Co.'s No. 20 Friesner, SE SE NW Section 32-2n-2e, pay at 3,378-3,415 ft., 5,000 gal. of acid, flowed 1,131 bbl. in 3 hours and was rated at 7,917 bbl. per day. Texas' No. 7 L. Maxwell, pay at 3,402 ft., total depth 3,450 ft., 5,000 gal. of acid, flowed 1,963 bbl. through casing and tubing. Texas' No. 24 A. McCollum, SE NW NE Section 32, pay at 3,362-3,402 ft., flowed 116 bbl. per hour naturally; acidized with 5,000 gal., it flowed 1,553 bbl. in 4 hours, and was rated at 8,871 bbl. a day. Texas Co.'s No. 4 H. Reynolds, NE SE NE Section 32-2n-2e, pay at 3,416-42 ft., 5,000 gal. of acid, flowed 5,733 bbl.

Few wells were completed in other pays than Devonian in the Salem field during the week. Texas Co.'s No. 6 McConnaghay, NE SE SE Section 32-2n-2e, was a 238-bbl. well in McClosky lime topped at 2,008 ft., total depth 2,085 ft. Texas' No. 10 Miller, C S½ NE SE Sec-

(Continued on Page 99)

INDIANA

EVANSVILLE, Ind., Mar. 16.—The most interesting news out of the southwestern Indiana fields is that purchasers are taking more of the daily production than at any time since the Griffin pool came in last year. Indiana's daily production has mounted as high as 10,000 bbl. per day.

Posey County

In Posey County Somers & Egan completed No. 2 Keck, SE NW NE Section 34-3s-14w. It pumped 77 bbl. per day after a 10-qt. shot at 2,555-66 ft., and a 15-qt. shot at 2,508-28 ft. It had been plugged back from 2,910 to 2,568 ft. J. E. Crosbie, Inc., completed No. 5 Keck, SW cor. NE Section 34-3s-14w. It was shot with 4 qt. at 2,151-56 ft., and with 15 qt. at 2,185-2,201 ft., and pumped 10 bbl. of oil and 50 bbl. of water the first day.

Nash, Redwine and others had rig up for No. 1 Renwick, 245 ft. from north and 990 ft. from west lines of SW SW Section 1-7s-12w, and made a location for No. 1 Reis, SW SW NE Section 1-7s-12w, on a Sun Oil Co. farmout. Sun Oil Co. made a location for No. 2 Renwick, C NW SE SW Section 1-7s-12w. Joe Minton was at a total depth of 3,013 ft. in No. 1 Hill, NW NE NW Section 7-4s-13w, and was drilling plug after setting 5½-in. casing at 2,569 ft. J. D. Wrather and others' No. 1 Keck, SW cor. NE NE NW Section 34-3s-14w, shot Aux Vases sand at 2,782-2,800 ft. with 20 qt. and the crew was cleaning out. Roberts Brothers' No. 3

(Continued on Page 92)

WESTERN KENTUCKY

OWENSBORO, Ky., Mar. 19.—A 60-bbl. well and a dry hole were completed in western Kentucky in the past week. Operations are at a very low point owing mainly to bad roads and a general muddy condition in the fields. Only four new operations were reported during the week.

In Daviess County, Utica district, H. C. Farmer and others' No. 1 Vernor Fitts, moving in. Stewart, Snyder & Sargant's No. 5 Roy Hansford, pumping 60 bbl. a day from Bethel sand, total depth 1,481 ft. In Handyville district J. C. Miller, trustee, and others' No. 2 W. Sargant, dry hole, total depth 1,865 ft.

In McLean County, South Livermore district, W. E. Hupp and others' No. 2 J. F. Smith, rigging up.

In Ohio County, Taffy district, E. DeHart and others' No. 7 M. S. Bartlett heirs, location. In Sunnydale district, J. Hunt and others' No. 2 Charles Russell, shut down at 300 ft. In Oaks district Raymond Miller and others' No. 3 Mrs. A. J. Lane, abandoned location.

EASTERN KENTUCKY

ASHLAND, Ky., Mar. 18.—Completion data on one well reported last week among the previous week's completions, is available today but no wells were completed during the past week. Activities continue on the same general trend with a new cold wave hampering some operations.

C. J. Sipple & Co. has completed No. 8 on the William Salyer land on Birch Branch in the Burning Fork district of Magoffin County at a total depth of 1,137 ft. The well is making 6 bbl. of oil daily.

(Continued on Page 83)

OHIO

WOOSTER, Ohio, Mar. 19.—Medina and Coshocton counties each yielded fair oil wells in the past week. Perry County reports a gas well with an open flow of better than 1,000,000 cu. ft. Total completions in the Ohio field covered by this report are 13, including 6 gas wells, 3 oil wells, and 4 dry holes.

In Athens County, Lodi Township, Ohio Fuel Gas Co.'s No. 1 Sam Jeffers, frac. Section 18, is a small gas well in the second Berea, total depth 1,601 ft.

In Coshocton County, Pike Township, Lupher Co.'s No. 1 E. A. Bryan, Section 19, is an oil well in the Clinton, making 72 bbl. the first 24 hours after a shot; sand at 3,082-3,140 ft.

In Fairfield County Lancaster Gas Works completed two Clinton tests. In Berne Township No. 1 C. Emde, Section 33, made 160,000 cu. ft. of gas on open flow at 2,081-2,105 ft.; in Pleasant Township No. 1 Casper Raab, Section 34, was dry, total depth 2,298 ft.

In Guernsey County, Millwood Township, M. J. Pur-

(Continued on Page 97)

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California Field Report

By
L. P. STOCKMAN

Kern County Deep Well Flows 2,205 Bbl. of 39.7 Gravity Oil

LOS ANGELES, Calif., Mar. 18.—Continental Oil Co.'s No. 5-8-A Kern County Land, Section 8-27-24, in the Wasco field of Kern County, which established a new fast deep-drilling record last week blew in a few days ago flowing 2,205 bbl. of 37.9-gravity oil and 700,000 cu. ft. of gas per day while the crew was coming out of the hole after drilling up a piece of the tail piece placed in the bottom of the hole. The bit and 12 ft. of drill pipe were left in the hole which means a fishing job or a sidetrack job if this well is carried into the lower zone. It is bottomed at 13,157 ft. and was finished with 399 ft. of blank 5-in. liner cemented at 13,125 ft. Top of the oil sand was cored at 13,151 ft. While the well blew in unexpectedly, it was kept under control and turned to tanks within a short time. The company drilled 13,157 ft. of hole and landed 12,878 ft. of 6⅝-in. water string in 60 days. The well reached 10,000 ft. in a total elapsed time of 21 days and made 12,000 ft. in slightly less than 40 days. In a total of 52 days the company had landed surface pipe at 995 ft. in addition to landing the 6⅝-in. water string. The remaining 8 days were taken up in running liner and making connections. The next completion in the Wasco field is scheduled to be Continental Oil Co.'s No. 1 Meyer, in Section 7-27-24, which has already passed the 12,200 ft. level. This well is on property subleased from Superior Oil Co. several months ago.

Current daily production of leading California fields follows:

	Bbl.
Wilmington	84,950
Midway-Sunset	59,450
Kettleman Hills	47,925
Long Beach	46,200
Ventura Avenue	36,550
Huntington Beach	27,850
Santa Fe Springs	26,390
Montebello	20,189
Santa Maria	11,450

Coalinga District

Two more excellent wells were completed in the Southeast Coalinga field of Fresno County and the next 30 days should see the completion of several, both in the Northeast and Southeast Coalinga fields. R. S. Lytle has completed No. 24-18-F, in Section 18-20-16, flowing 2,072 bbl. of 31.6-gravity and 1,532,000 cu. ft. of gas from 7,533 ft. and Texas Co. has completed No. 2 Anderson in Section 6-20-16, flowing 758 bbl. of 29.9-gravity and 250,000 cu. ft. from 8,165 ft. No. 24-18-F was brought in flowing through a 20/64-in. bean and showed a tubing pressure of 1,050 lb. and a casing pressure of 1,350 lb. It was finished with an 8⅝-in. water string cemented at 7,020 ft. and 543 ft. of 6⅝-in. liner landed on bottom and carrying perforations at 7,047-67 ft., 7,088-7,152 ft., 7,191-7,285 ft., 7,321-7,436 ft. and 7,474-7,512 ft. A total of 7,513 ft. of 2½-in. tubing completed the subsurface pipe. Top of the Kreyenhagen was cored at 5,875 ft., top of the glauconitic was logged at 6,957 ft., top of the grit zone was found at 6,970 ft. and top and bottom of the productive Gatchell sand was cored at 7,018 ft. and 7,513 ft. respectively.

Texas Co.'s No. 2 Anderson, which has an elevation of 666 ft. above sea level, was finished with a 7-in. water string cemented at 7,998 ft. and 211 ft. of drillable liner landed at 8,163 ft. and perforated at 8,005-8,163 ft. and 8,120 ft. of 2-in. tubing. Top of the Kreyenhagen was cored at 6,767 ft., top of the glauconitic was logged at 7,989 ft. and top of the grit zone was found at 7,999 ft. Top of the productive Gatchell zone was cored at 8,010 ft. and the bit was still in the pay when drilling operations were concluded.

Bandini Petroleum Co. made a formation test of No. 46-18-B in the Northeast Coalinga field this week and it flowed at the rate of 500 bbl. of condensate and about 52,000,000 cu. ft. of gas. This well logged only a very limited amount of oil sand and the company carried the hole down for a deep test which failed to change the outlook. No. 46-18-B of Bandini Petroleum Co. is at present bottomed in the Cretaceous at 9,614 ft. but the formation test was made of an interval of the Gatchell sand at 7,954-70 ft. A 7-in. water string has been landed and cemented at 7,940 ft. This well is in the SW Section 18-19-16 and should be ready for a production test within a few days. In the extreme southern end of the Southeast Coalinga field, Universal Consolidated Oil Co. is drilling in its second well in Section 24-20-15 at 7,500 ft. but has not yet cored top of the Gatchell sand. Pure Oil Co. has completed derrick for No. 44-30-B Schwinn in Section 30-19-16, in the southern end of the Northeast Coalinga field, in an area where Bandini Petroleum Co. recently completed a commercial producing well.

Canal—Ten Section

Drilling operations in both the Canal and Ten Section fields of Kern County have been reduced to two strings of tools in each field, and there is no indication work will be increased or changed in the near future. In the Canal field, Shell Oil Co., Inc., this week completed No. 85-15-A Kern County Land in Section 15-30-25, flowing 1,357 bbl. of 36.7-gravity oil and 1,455,000 cu. ft. of gas from the Stevens sand with bottom at 8,250 ft. This well, which extends the productive limits of the Canal field location to the west, shows a tubing pressure of 149 lb. and a casing pressure of 950 lb. In the Ten Section field, Shell should have No. 34-28-B Kern County Land in Section 28-30-26, ready for a production test within another week as the bit late in the week was 8,107 ft. In the Strand field of Kern County, which to date has been controlled exclusively by Tide Water Associated Oil Co. and Shell Oil Co., Inc., the latter failed to develop commercial production in No. 64-12-A Kern County Land in Section 12-30-25. This well, a joint undertaking of Shell and Ohio, flowed a small quantity of oil along with a much larger quantity of water on a test of the interval at 8,445-8,505 ft. and has been suspended indefinitely.

Cole's Levee—Tupman

The Cole's Levee and Tupman fields of Kern County discovered by Ohio Oil Co. and Richfield Oil Corp., respectively, are rapidly becoming active. In the southern end of the area, Shell Oil Co., Inc., has reached a depth of 10,191 ft. but has not yet found the pay, with the outlook not any too bright for production. The possibility that these two fields may finally be found to be one large field instead of two separate productive areas has not yet been determined. There are not enough data available to make a definite prediction either way. Until there is ample information the area is being handled as two separate fields by reporting agencies. Ohio Oil Co. keeps one string of tools going in the Tupman field continuously, as a new well is spudded in as soon as the crew has been relieved from a drilling well. Richfield Oil Corp., operating in both Cole's Levee and Tupman sections of the area, is running five strings of tools and has plans to begin work on several additional wells. It is possible additional work will be retarded until some of the drilling wells have been completed. Standard Oil Co. and Union Oil Co. have both cut down or entirely eliminated all work in the area as has also the Tide Water Associated Oil Co. Standard's last completion in this district was No. 20-2 Kern County Land in Section 9-31-25, but it only made 245 bbl. per day from 9,190 ft. with bottom at 9,504 ft. which indicates that no rush will be made to proceed with additional work on the same section.

Wilmington

Three new Ranger zone wells were completed in the Wilmington field of Los Angeles Basin this week and their aggregate initial daily production was rather small. Continental Corp., not Continental Oil Co., has completed No. 4 L.A.C.F.C. flowing 646 bbl. of 17.7-gravity oil through a 36/64-in. bean from 2,979 ft. This well, like previous completions on the lease and as will be the case with subsequent completions, was drilled from a long narrow strip paralleling the Los Angeles Flood Control and was bottomed beneath the channel itself by directional drilling. To do this it did not require very much of a deviation as the wells are within a relatively few feet of the banks of the channel. No. 4 L.A.C.F.C. was finished with an 8⅝-in. water string cemented at 2,584 ft. and 447 ft. of 5½-in.

TANKER SHIPMENTS FROM LOS ANGELES TO DOMESTIC AND FOREIGN PORTS

	March 10		March 3			
	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Intercoastal-domestic—						
Crude oil	.....	.....	.....	.....	.....	60,642
Fuel oil	.....	.....	.....	.....	152,798	324,591
Diesel and gas oil	.....	.....	.....	.....	.....	163,501
Gasoline	.....	.....	150,746	21,535	276,611	302,594
Kerosene	.....	.....	.....	.....	.....	56,940
Foreign exports—						
Crude oil	183,139	26,163	367,163	52,452	2,798,487	2,948,789
Fuel oil	282,714	40,388	107,962	15,423	1,535,173	1,383,687
Diesel and gas oil	174,402	24,915	8,690	1,241	1,334,891	772,003
Gasoline	.....	.....	201,193	28,742	958,769	1,700,151
Kerosene	.....	.....	27,122	3,875	187,196	234,289
Coastwise-domestic—						
Crude oil	150,136	21,448	236,220	33,746	2,127,048	1,883,162
Fuel oil	358,568	51,224	289,926	41,418	2,876,697	1,740,405
Diesel and gas oil	60,454	8,636	80,057	11,437	590,306	564,165
Gasoline	240,590	34,370	269,891	38,556	2,722,105	2,255,416
Kerosene	17,270	2,467	4,591	656	95,706	76,948

TANKER SHIPMENTS FROM SAN FRANCISCO TO DOMESTIC AND FOREIGN PORTS

Intercoastal-domestic—						
Fuel oil	.....	.....	.....	.....	68,740	.....
Diesel and gas oil	.....	.....	70,547	10,078	281,260	69,550
Asphalt	.....	.....	73,200	10,457	73,200	.....
Lubricants	.....	.....	3,996	571	7,606	4,170
Foreign exports—						
Crude oil	.....	.....	136,754	19,536	392,048	918,258
Fuel oil	.....	.....	.....	.....	175,155	344,717
Diesel and gas oil	.....	.....	73,173	10,453	353,208	306,306
Gasoline	.....	.....	20,799	2,971	405,541	610,230
Kerosene	.....	.....	16,306	2,329	84,859	148,834
Lubricants	.....	.....	.....	.....	79,651	84,271
Other finished oil	.....	.....	.....	.....	117	.....
Coastwise-domestic—						
Fuel oil	150,129	21,447	73,180	10,454	1,265,952	1,030,592
Diesel and gas oil	31,601	4,514	39,212	5,602	265,305	87,454
Gasoline	176,996	25,285	148,604	21,229	1,480,040	694,173
Kerosene	13,121	1,874	12,955	1,851	132,802	109,754

liner landed on bottom and with gravel packed perforations at 2,578-2,979 ft. and 2,594 ft. of 2½-in. tubing with a packer at 2,494 ft.

Union Pacific Railroad Co., largest fee owner of productive acreage in the Wilmington field, has completed No. 4 Pacific Dock flowing 295 bbl. of 20.7-gravity oil from the Ranger zone with bottom at 2,787 ft. This well was completed with a 7-in. water string cemented at 2,574 ft. and 312 ft. of 4¾-in. liner landed on bottom and carrying perforations at 2,477-78 ft., 2,498-2,555 ft. and 2,575-2,787 ft. and 2,445 ft. of 2½-in. tubing. Union Pacific Railroad Co. is running seven strings of tools in the Wilmington field and will apparently maintain about this number as the company has either erected new derricks or has rigs in course of construction for an additional five wells. Most of the wells now being drilled are inside locations and the company is not rushing development except for efficiency. Plenty of time is being taken between wells, so this is not working against curtailment. Dumm Bros. Petroleum Corp. has completed No. 5 Harbor in the Wilmington field flowing 115 bbl. of 14.7-gravity oil through a 34/64-in. bean from the Ranger zone with bottom at 3,465 ft. No. 5 Harbor was finished with an 8⅝-in. water string cemented at 3,115 ft. and 380 ft. of 5½-in. liner landed on bottom and carrying perforations at 3,115-3,465 ft. Production is flowing through 3,445 ft. of 2½-in. tubing with a packer at 3,077 ft. The Wilmington field is rather well drilled up as far as the Ranger and Terminal zones are concerned, but there are at least 150 locations available for work whenever operators decide to proceed with exploitation of the underlying Ford zone which is being held back as a curtailment measure.

Montebello

Two wells were put on production in the Montebello extension during the week and two more are being swabbed with indications pointing to their early completion. One of the wells finished was Standard Oil Co.'s No. 8 Braun, a recompletion, which was killed early in the week to permit the crew to perforate the casing opposite the gas cap in the upper La Merced zone. Gun perforations were made at 7,020-95 ft. and at 7,125-50 ft. and the well returned to production flowing 1,293 bbl. of 35.3-gravity oil per day through a 1-in. bean. The hole was finished with 7,424 ft. of 2½-in. tubing with a packer at 7,212 ft. and an Otis valve at 7,210 ft. In addition to the crude produced the well is flowing 2,500,000 cu. ft. of gas but in accordance with an existing court order gas production must be immediately brought down so crude oil production will also show a drop.

George F. Getty, Inc., and Pacific Western Oil Co. jointly developing several leases in the Montebello extension, this week completed No. 1 Pfister, flowing 405 bbl. of 35.2-gravity oil, cutting 4 per cent, from the La Merced zone with bottom at 7,610 ft. Brought in flowing through a 23/64-in. bean it showed a tubing pressure of 385 lb. and a casing pressure of 650 lb., and was finished with a 7-in. water string cemented at 7,507 ft. and 121 ft. of 4¾-in. liner including 96 ft. of perforated landed at 7,607 ft. and 7,596 ft. of 26-in. tubing with a packer at 7,430 ft. Columbia Oil Co. expected to have No. 1 Scheinik tanking oil this week but found the well began making considerable drilling mud and weight material indicating the bottom of the hole had deviated from the vertical and apparently intercepted the drilling stream of some other well. Accordingly the well was killed and the drillable liner drilled up and the hole plugged back from 7,656 ft. to 7,473 ft. preparatory to a redrilling job.

Los Angeles Basin

In the Rosecrans field of Los Angeles County Union Oil Co. has completed No. 38 Rosecrans flowing 350 bbl. of 32.2-gravity oil along with 400,000 cu. ft. of gas from the O'Dea zone with bottom at 7,884 ft. and plans are under way to make a production test of No. 39 Rosecrans in the same field within the next week. In the Huntington Beach field, Southwest Exploration Co. completed another good tideland well when No. 25 State was brought in pumping 604 bbl. of 25.5-gravity oil from 4,595 ft. This well, which was deviated beneath the ocean, was finished with an 8⅝-in. water string cemented at 3,770 ft. and 844 ft. of 6⅝-in. liner landed at 4,590 ft. and including perforations at 3,770-4,590 ft. No. 25 State is within a few hundred feet of the tide line and has an elevation of 47 ft. Pacific American Oil Co. has completed No. 6 Encyclopedia in the Huntington Beach field pumping 28 bbl. of 22.9-gravity oil cutting 20 per cent from 3,873 ft. It was finished with a 7-in. which was cemented at 3,873 ft. and again through perforations at 580 ft. and then gun-perforated at intervals. In the Harbor City section of the Torrance field and a short distance west of the west end of the Wilmington field, Vesta Petroleum Co. has completed No. 1 Palos Verdes, pumping 80 bbl. of 21.3-gravity oil cutting 5 per cent. It may require some additional work before it remains on sustained production. It was finished with a 7-in. water string cemented at 3,560 ft. and 186 ft. of 5½-in. liner including 146 ft. of 120-mesh perforations and 3,447 ft. of 2½-in. tubing. The hole was originally carried down to 3,800 ft. but was plugged back to 3,706 ft. prior to completion. Bren Oil Co. made a formation test on its Torrance field outpost with bottom at 6,095 ft. and, while a strong blow of gas was recorded, it remains to be seen whether the company will be able to make a commercial producer. Top of the Ranger zone was cored at 3,380 ft., top of the Miocene at 3,648 ft., top of Pokerchip shale at 3,660 ft., top of Terminal zone at 3,764 ft., top of Del Amo zone which was barren at 5,405 ft., top of nodular shale at 5,838 ft. and top of the conglomerate at 6,010 ft.

San Joaquin Valley

Texas Co. completed a good well in the Midway-Sunset field of Kern County when No. 38 in Section 32-32-24 was finished, pumping 127 bbl. of 23.3-gravity oil from 3,150 ft. It was carried to 3,193 ft. and plugged back to the completion depth. It was finished with a 6⅝-in. water string cemented at 3,080 ft. and 90 ft. of 4¾-in. liner landed at 3,150 ft. and perforated at 3,080-3,150 ft. Standard Oil Co. completed a commercial gas well in the Delano gas field of Kern County and recent indications point to additional development by both Standard Oil Co. and Trico Oil & Gas Co. Standard's new producer was No. 2 Bryson in Section 28-24-23, flowing 3,540,000 cu. ft. of gas from the Mya at 2,470 ft. This well, which was drilled from spud to completion in 11 days, was finished with a 6⅝-in. water string cemented at 2,398 ft. and 107 ft. of 5-in. liner landed on bottom and carrying 60-mesh perforations at 2,401-70 ft. Production was brought in through a 33/64-in. bean and the well showed a tubing and casing pressure equalized at 505 lb. Richfield

(Continued on Page 99)

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By
F. L. SINGLETON

Wade City, Jim Wells Area, Due For Increased Drilling

CORPUS CHRISTI, Tex., Mar. 18.—Increased drilling in the Wade City field, Jim Wells County, is anticipated as one new oil well was recorded and another outpost reached the testing stage.

Rodney DeLange's No. 3 McNeil perforated casing at 4,931-39 ft. and was completed for an initial production of 38 bbl. of 31.5-gravity oil daily, flowing through a 4/64-in. choke. Casing pressure was 800 lb. and tubing pressure 675 lb. North of the well Henshaw Brothers' No. 1 McNeil is bottomed at 4,975 ft., and casing is being cemented on bottom, following a drill-stem test at 4,928-31 ft., which recovered 740 ft. of oil. Drill-stem testing in the 4,800-ft. horizon recovered 200 ft. of fluid of which 50 per cent was oil and some salt water. This field was originally a distillate producer and the first oil production was opened 3 weeks ago.

Location was being cleared for a new well in the East Mathis field, San Patricio County, Seaboard Oil Co.'s No. 1 W. F. Lovett. The well will be drilled in Block 13, Paul's subdivision of the Welder ranch. Contract depth is 5,500 ft.

Sun Oil Co.'s No. 1 Valerio showed promise of opening important oil production in the Muralla field, Duval County, as an 18-minute drill-stem test at 4,699-4,706 ft. tested 70 lb. working pressure and recovered 1,540 ft. of oil. Five and one-half inch casing was cemented on bottom at 4,708 ft.

In the same county and about 3 miles west of the Sejita field C. Andrade is preparing to spud No. 1 Miller. Location is 467 ft. from the north and east lines of the NW Section 62, Copita Farm and Garden subdivision. About 8 miles northwest of the Fitzsimmons field, Mayfair Oil Corp. and others' are moving in material for No. 1 Yates in Section 1, S.A.&M.G.R.R. Survey.

In the Sejita field, Duval County, Standard Oil Co. of Texas' No. 1 Rodriguez flowed 16 bbl. of distillate per day through a ¼-in. choke to extend production to the north. Casing was perforated at intervals from 5,475-5,660 ft.

Prospects Not Encouraging

Reports from the deep tests being drilled along the old Jackson shore-line trend in search of Tertiary Wilcox production were not encouraging. In De Witt County Atlantic Refining Co.'s No. 1 Conwell is awaiting orders at a total depth of 8,519 ft. Slight showings are reported to have been cored in the upper Wilcox but whether they were significant enough to test is not known.

In Bee County Bunte Brothers and others' No. 2 J. T. Earnest, southwest of Beeville, has reached a contract depth of 9,531 ft., and an electrical survey is being made. In the West Tuleta field Mills Bennett Production Co. and Anderson-Prichard Oil Corp.'s No. 2 D. E. Robinson is drilling in shale below 8,626 ft., after making an electrical survey at 8,617 ft. In the old Pettus field Union Producing Co.'s No. 56 Ray is drilling in shale below 7,758 ft.

Near the town of George West, Live Oak County, E. M. Jones' No. 1-A West topped the Wilcox at 7,450 ft., and the well is drilling below 8,100 ft. with no shows reported.

Northeast of Laredo, Webb County, O. W. Killam is reported to be making preparations to start a 9,500-ft. Wilcox test on the L. R. Oritz ranch. Sinclair Prairie Oil Co.'s No. 1 Callaghan ranch, approximately 20 miles northeast of Laredo, is drilling in shale below 5,500 ft.

Victoria's 3,000-Ft. Pay Again Yields

The second oil well for the 3,000-ft. sand in the Victoria field, Victoria County, is W. V. Hardin and others' No. 1 Buckert, which flowed 350 bbl. per day through a ¼-in. choke from perforated casing at 3,040-43 ft. Luling Oil & Gas Co.'s No. 1 Miller cored sandy shale with an oil odor at 3,042-46 ft., and oil sand at 3,046-52 ft. Casing is being cemented for completion.

West of the Kelsey field, Starr County, Royal Oil & Gas Co.'s No. 1 Juarez perforated casing at 4,510-16 ft., and on a 55-minute drill-stem test the well flowed salt water at the end of 31 minutes. The perforations were squeezed off preparatory to retesting.

The producing area of the Rincon field, Starr County, continues to expand as two producers and one gas well were added to the structure. In Survey 266 W. R. Davis & Co.'s No. 14-B Slick was flowing an estimated 10 bbl. per hour through ¼-in. choke from perforated casing at 4,848-60 ft. The company's No. 13-B Slick flowed 85 bbl. daily from sand at 4,220-34 ft., and the company was attempting to kill the well to recomplete due to a high gas-oil ratio. No. 12-B Slick perforated casing at 4,237-49 ft., and was completed for an estimated 250 bbl. daily, flowing through a ¼-in. choke.

Along the Balcones fault line J. E. Dickson staked location for No. 1 Jeff Connolly in the J. D. Rains Survey, Caldwell County. The well is situated about 6,500 ft. northeast of the Salt Flats field and will be drilled to the Edwards lime.

In Milam County Fritz Fuchs' No. 1 Urnasch is shut down at a total depth of 1,895 ft., and casing may be set to test the Edwards lime. The well topped the Austin chalk at 1,100 ft., logged the base of chalk at 1,550 ft., topped the Buda lime at 1,620 ft., the Del Rio lime at 1,645 ft., Georgetown at 1,682 ft., and the Edwards lime at 1,890 ft. The lime was drilled from 1,890-95 ft., and cutting from the formation showed a slight stain of oil. The well is about 3½ miles north of Thorndale in the Jose Just Liendo Survey.

Taylor Refining Co.'s No. 2 Hurta, a wildcat in Williamson County, is shut down for repairs after topping the Edwards lime at 1,386 ft. A small amount of Dobie lime cored at 1,384-86 ft., is reported to have carried a slight oil odor.

SOUTHWEST TEXAS COMPLETIONS IN PROVEN FIELDS

Aransas-San Patricio Counties

McCampbell field: Bay-Tex Oil Corp.'s No. 1 Blankmeyer-Revare, perforated casing 7,114-24 ft., 127 bbl., 4/64-in. choke. Puertoro Petroleum Co.'s No. 1-16 Losoya, perforated casing 7,113-23 ft., 78 bbl., 4/64-in. choke. Southern Minerals Corp.'s No. 1 Mayo, perforated casing 6,554-58 ft., 84 bbl., ⅛-in. choke.

Duval County

Benavides field: Henderson-Coquat's No. 1 Momeny, 6,025 ft., dry and abandoned. Southwood Oil Co.'s No. 8-A Rossi, 5,378 ft., dry and abandoned. Cedro Hill field: Humble Oil & Refining Co.'s No. 4-F Duval County Ranch Co., 1,428 ft., 21 bbl., 7 hours, pumping. Magnolia Petroleum Co.'s No. 24 Duval County Ranch Co., sand 1,433-40 ft., 16 bbl. per day pumping. Driscoll field: Continental Oil Co.'s No. 46-A Driscoll perforated casing 3,345-61 ft., 243 bbl., ¼-in. choke. Seven Sisters field: Wellington Oil Co.'s No. 3-G Welder, perforated casing 3,052-58 ft., gas well.

Guadalupe County

Elm Creek field: J. E. West's No. 1 Hartfield, sand 733-39 ft., 7½ bbl., pumping.

Jim Wells County

Ben Bolt field: Bridwell Oil Co.'s No. 4 Beasley, perforated casing 5,203-08 ft., 239 bbl., 4/64-in. choke. Bridwell Oil Co.'s No. 6 Beasley, perforated casing 5,227-35 ft., 288 bbl., 4/64-in. choke. Heyser & Heard's No. 1-D Garcia, perforated casing 5,255-72 ft., 397 bbl., 4/64-in. choke. H. J. Mosser's No. 5 Perales, 5,322 ft., 398 bbl., 4/64-in. choke.

Milam County

Rockdale field: H. H. Coffield's No. 2 Niehaux, 890 ft., dry and abandoned.

Nueces County

South Clara Driscoll field: Wellington Oil Co.'s No. 5 Richardson, 6,664 ft., 143 bbl., 4/64-in. choke.

San Patricio County

East White Point field: Easterwood Production Co.'s No. 1 Foran and Sharp, perforated casing 5,617-22 ft., 108 bbl., 7/64-in. choke. O. W. Killam's No. 9 Taft, sand 5,602-12 ft., 128 bbl., ⅛-in. choke. Sinclair Prairie Oil Co.'s No. 6 State, perforated casing 3,940-85 ft., gas well. Midway field: Midway Victory Oil Co.'s No. 2 Floerke, perforated casing 5,320-22 ft., 87 bbl., ⅛-in. choke.

Starr County

Sun field: Sun Oil Co.'s No. 8 McKinney, 4,982 ft., 115 bbl., 4/64-in. choke. Sun Oil Co.'s No. 3-A Montalvo, perforated casing 4,590-91½ ft., 74 bbl. oil and 11 bbl. of water, 5/32-in. choke.

Victoria County

East Telferner field: W. V. Bowles's No. 2 Robertson, 6,612 ft., dry and abandoned.

Webb County

Adami field: Arkansas Fuel Oil Co.'s No. 7-B Adami, sand 997-99 ft., 20 bbl., pumping. Bridwell Employes Oil Co.'s No. 4-A Adami, sand 992-94½ ft., 18½ bbl. oil and 20 bbl. salt water, pumping. Dan Purvis' No. 4 Adami, sand 1,002-02 ft., 40 bbl., pumping. Volpe field: Magnolia Petroleum Co.'s No. 24 Volpe-Benavides, 2,628 ft., dry and abandoned.

Williamson County

Byersville field: N. G. Hawkins' No. 1 Bachmeyer, 930 ft., dry and abandoned.

Zapata County

Escobas field: George Buck's No. 7 Trevino, 1,408 ft., 75 bbl., pumping.

Eastern Kentucky

(Continued from Page 80)

In Knott County Inland Gas Co. is drilling at 1,725 ft., in Third Salt sand, in No. 212, W. H. Smith and others land, on Perkins Branch.

The Kentucky-West Virginia Gas Co. is rigging up No. 5264 on the W. H. May land, on Long Branch of Jones Fork, and is down 1,830 ft., in sand, in No. 582, on the B. F. King tract, on Joe King Branch. The same company is rigging up No. 584 on the Jeffie Hall land on Isaac Fork of Right Beaver.

In Floyd County Kentucky-West Virginia Gas Co. is rigging up No. 585 on the A. C. Webb tract on Sanson Fork of Prater Creek, and is moving to No. 586 on the Levi Mitchall land on Mitchell Branch of Mud Creek. Same company is moving to No. 5262 on the W. R. Hall land on Jacks Creek of Left Beaver; has made location for No. 5265 on the James Sturgill farm on Keathley Branch of Toler Creek, and is rigging up No. 5253 on the George McKinney farm.

In Martin County Kentucky-West Virginia Gas Co. was drilling at 576 ft. in No. 583 on the Wilson Short land on Rockcastle.

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Among the Drilling

SULTANA DRILLING CO., of Shreveport, La., is drilling two wells in the Magnolia field and one in the Miller County extension of Rodessa in Arkansas. At Magnolia, Normandie Oil Corp.'s No. 2 Boothe is approaching the Smackover lime, and a Sultana rig is up on the No. 3-B King, location of Arkansas Fuel Oil Co., located 330 ft. north of the No. 2-B, which recently was abandoned as an edge failure after testing oil and salt water. In Miller County, Skelly Oil Co. and Pacific Western Oil Co.'s No. 1 Wallis is drilling below 5,800 ft.

PLAINS PRODUCTION CO., of Dallas, is drilling the Issequena County, Mississippi, wildcat of Tatum, Dunbar & Shaddock. The wildcat, No. 1 Mohanna, is running high on the chalk and is contracted to 6,000 ft. It is located on a 19,200-acre block.

GEORGE ECHOLS has started drilling operation on a deep test in the League City field, Galveston County, Texas. Two rotaries are running in the South China field, Jefferson County, for Titanic Oil Co., while another operation is reported in Liberty County for Titanic Oil Co.'s joint test with Hebert & Smith.

J. R. ROBERTS has started a marine operation offshore from Kleberg County, Texas, for Skelly Oil Co. The well is located on Tract 385 in the Laguna de los Olmos Survey.

AL BUCHANAN DRILLING CO. received contract from H. R. Cullen for a projected 12,000-ft. wildcat located about 7½ miles southwest of Fowlerton in La Salle County, Texas. The well is on the J. L. Washburn lease in the L. W. Earnest Survey 88.

ROWAN & NICHOLS will drill a 6,500-ft. wildcat northwest of the Cedar Bayou field in Harris County, Texas. The well is located on the L. G. Lobit lease in the B. Barrow Survey.

LOFFLAND BROTHERS has contracted to drill the 4,500 ft. core test, J. M. Hazelwood, Fohs Oil Co., and others' No. 1 Miller in Arkansas County, Arkansas.

GROOVER & ROSE, operating and contracting firm of Albany, Tex., has been given contract for a new wildcat test to the Palo Pinto lime in Jones County, West Central Texas. It is Iron Mountain Oil Co.'s (Fort Worth) No. 1 I. F. Wiley, located 330 ft. from the south and east lines of the lease and 2,348 ft. from the west line of Section 14, Deaf & Dumb Asylum Lands Survey. Test will be drilled with cable tools.

ALLEN & MORRIS extended distillate production in the Sejita field, Duval County, Texas, with the completion of Standard Oil Co. of Texas' No. 1 Rodriguez. Two operations are reported in the La Rosa field, Refugio County, for Coronado Corp. and Shield Oil Co., while in Calhoun County one rotary is being used on a wildcat for Coronado Corp.

CROSBY DRILLING CO. has moved a rotary to the Bayou Blue dome, Iberville Parish, coastal Louisiana, where a joint test with T. G. Markley will be drilled on the Baiste Cooperage Co. lease on the west flank of the dome.

H. W. BASS DRILLING CO., Dallas, Tex., has been awarded the drilling contract on Tide Water Associated Oil Co.'s recently staked wildcat test in Terry County, West Texas. The wildcat is No. 1 Oran Buckner, NE SW Section 3, Block 37-C, P.S.L. Survey, southern part of the county. It is 10 miles north and a mile west of the Cedar Lake field of northeastern Gaines County. The wildcat is contracted to 5,000 ft.

HARRY L. EDWARDS DRILLING CO., Houston, Tex., has let contract to drill L. J. Sessions' No. 1 J. T. Barry, test in the old Yarboro area of Grimes County, Gulf Coast area. Location is in the southwest corner of a 160-acre tract in the S. Fulton Survey, Abstract 16, and is projected to the Wilcox sand.

LOFFLAND BROTHERS, Tulsa, have the drilling contract on Barnsdall Oil Co.'s recently staked 10,000-ft. wildcat test in the Buckeye area of Matagorda County, Gulf Coast area, Texas. The test is No. 1 Stoddard estate, southwest corner of the G.B.M. Cotton Survey.

TWO STATES DRILLING CO., Dallas, Tex., has let a rig and drilling crew on a day basis to the Amerada Petroleum Corp. for the drilling of its recently staked 8,000 ft. wildcat test in Wilbarger County, North Texas. The wildcat is Amerada's No. 1 Goodpasture, 466 ft. from the south and west lines of Section 35, Block 15, H.&T.C. Survey, 2 miles northwest of Fargo. The projected 8,000 ft. is expected to carry it to the Ellenburger lime of Lower

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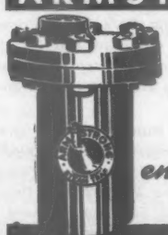

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Contractors

Ordovician. The wildcat is approximately 15 miles west of Arbuckle lime production in Tillman County, Oklahoma.

LOFFLAND BROTHERS are moving rotary to Wadsworth area, Matagorda County, Texas, for Deep Rock Oil Corp.'s No. 1 Tom Petrucha, a projected 10,500-ft. wildcat located 3 miles southwest of Wadsworth in the F. W. Dempsey Survey.

OLSON DRILLING CO., Tulsa, was moving in material and preparing to deepen Anderson-Prichard Oil Corp. and others' No. 1 Geis, Section 15-18-9w, gas discovery well in Kingfisher County, Oklahoma. After being drilled to original contract depth of 8,507 ft., it was plugged back and completed last fall for 2,000,000 cu. ft. of wet gas daily. Under the new contract, it will be deepened 1,000 ft., or to second Wilcox sand. Several major companies are interested. Location is on a 7,000-acre block.

SUMMIT DRILLING CO., Tulsa, Paul McIntyre and associates have the sixth producer on the West Weleetka pool, Okfuskee County, Oklahoma, at No. 1 Steil, Section 18-10-11e. It flowed 1,695 bbl. of oil in 15 hours at total depth of 2,150 ft. in Booch sand.

DAVIS BROTHERS Drilling Co., Independence, Mo., have the contract to drill Carl Lebsack and O. J. Wamhoff's No. 1 Maduska, Section 36-8-20w, wildcat about 10 miles west of Leavenworth, Kans., in the Forest City basin. Cellar and pits were being dug and equipment was being moved in.

J. E. TWIGG, Oklahoma City, has started work at No. 1 Rosek, Section 13-12-23w, wildcat south of the Wakeeney pool, Trego County, Kansas, as result of a deal with L. D. Davidson, Wichita operator, who took a farmout from Phillips Petroleum Co. The Phillips company has a large block of acreage in the area.

DOUTHIT DRILLING CO., St. Louis, Mo., is drilling a regionally "deep" test in the old shallow area in Monroe County, Illinois, north of Waterloo and southwest of Belleville. It is S. Brooks Remington's No. 1 Kolmer, Section 2-2s-10w. Drilling with cable tools, it was reported to have had good showings of oil in upper Trenton pay around 400 ft. and to have found a previously undiscovered pay in lower Trenton at 460-80 ft., with good showings. St. Peter sand, topped at 825 ft., carried sulfur water. The crew was drilling ahead toward the 1,800-ft. contract depth; and if lower levels are found barren, it will be plugged back and tested in the Trenton pays.

WILSON DRILLING CO., Robinson, Ill., will use cable tools in drilling a St. Peter sand test in Greene County, Indiana, at Frank Lyons and Carl Schricker's No. 1 Della Kisser, NW NW Section 4-7n-5w, it was reported. It is said to have major company support.

CARTER & RUBSAMEN Drilling Co. received contract from Carolina Texas Oil & Gas Co. for a 5,500-ft. Queen City test to be drilled in the Carolina-Texas field, Webb County, Texas. The well is No. 13 Houston Oil Co. in Block 13, Survey 268.

Daylight crew on Universal Consolidated Oil Co.'s No. 61-24-C in Coalinga, California, field. E. Hittson, W. H. Walker, Ed Brown, W. T. Laing, O. G. Pierce, R. P. Alexander

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Extend Slaughter Field in Hockley County Mile South

By
D. H. STORMONT

MIDLAND, Tex., Mar. 18.—Already a major West Texas oil field, the Slaughter field of Hockley County has been given a mile-south outpost to extend the play into northern Terry County. Also centering interest in the district were three additional either rank wildcats or semiwildcats seeking to extend proven fields. The wildcats were in Crockett and Terrell counties, while both the Pennwell field of Ector County and the Keystone field of Winkler County received outpost locations.

The northernmost producer from the Holt lime in Ector County's 5,200-ft. area received its official gage during the week to keep the district's deep play in the limelight.

Seeking to extend production in Hockley County's Slaughter field a mile south and into Terry County, George P. Livermore of Odessa announced location of his No. 1 M. E. Jackson, 540 ft. from the north line and 440 ft. from the east line of Section 6, Block 11-D, C.&M. Survey. The test is a mile south of his No. 1 R. D. Glimp, completed a few weeks ago for 891 bbl. of oil daily to extend production about a mile south of the field proper. It was also revealed that the acreage acquired to drill No. 1 Glimp carried the obligation to drill the Terry County test should commercial production be obtained.

On the north end of the field Delta Drilling Co.'s No. 1-A R. L. Slaughter, a mile-outpost test, SE cor. Labor 21, League 41, Maverick County School Lands Survey, reported a flow of 110 bbl. of oil in 14 hours. It is bottomed at 4,976 ft., where it has been acidized with 2,000 and 6,000 gal. in the pay section from 4,870 ft. to the total depth.

Wildcats and Extensions

Contract for a 2,500-ft. wildcat in north central Crockett County was let during the week by Spears Interests, Fort Worth. With operations scheduled to commence this week, the location is on the A. C. Hoover ranch, SW 40 acres of the NW Section 10, Block 1, G.C.&S.F. Survey, some 20 miles northwest of Ozona. The wildcat is 1¼ miles northwest of a well producing from the 1,900-ft. level and a similar distance southwest of another well producing from the 1,400-ft. level.

A semiwildcat test was staked in the northern part of the Pennwell area of Ector County by Waldrop & Patillo as their No. 1 McKenzie. It is 467 ft. from the south line and 1,170 ft. from the east line of the N½ SE Section 28, Block 45, T-2-S, T.&P. Survey.

Production a mile north of the Keystone field in Winkler County will be sought at a location staked by Gulf Oil Corp. as its No. 1-A W. F. Scarborough, 440 ft. from the south and east lines of Section 7, Block 22-C, Public School Lands Survey. The location falls a mile north of Sid W. Richardson's No. 1 Sun-Jenkins, a north outpost producer completed several months ago. The Gulf company's block expires September 1.

Deep Activity

Official gage at Stanolind Oil & Gas Co.'s No. 1 W. F. Cowden, most northern producer from the 5,200-ft. Holt lime, marked the completion of the fourth oil producer from the deep level. No. 1 Cowden, S½ Section 4, Block 43, T-1-S, T.&P. Survey, 2 miles north and a mile west of the discovery Holt horizon producer, gaged 97 bbl. of oil and 60 bbl. of water on a 24-hour pumping gage. The well had been acidized with a total of 7,000 gal. in the pay section from 5,146 to 5,215 ft., total depth.

The producing capacity of Landreth Production Corp.'s No. 2-A TXL, outpost 1½ miles south of the southernmost producer from the Holt lime, remained uncertain as the week closed. On daylight swabbing tests at intervals during a 48-hour period the test recovered 93 bbl. of oil and 27 bbl. of water. The pay section from 5,189 to 5,196 ft. has been acidized with a total of 3,000 gal. in two treatments. The second acid treatment brought bottom-hole water in the test to establish the water level 16 ft. below the level in the nearest deep test 1½ miles to the north. No. 2-A TXL topped the Holt lime some 31 ft. lower than the producer to the north.

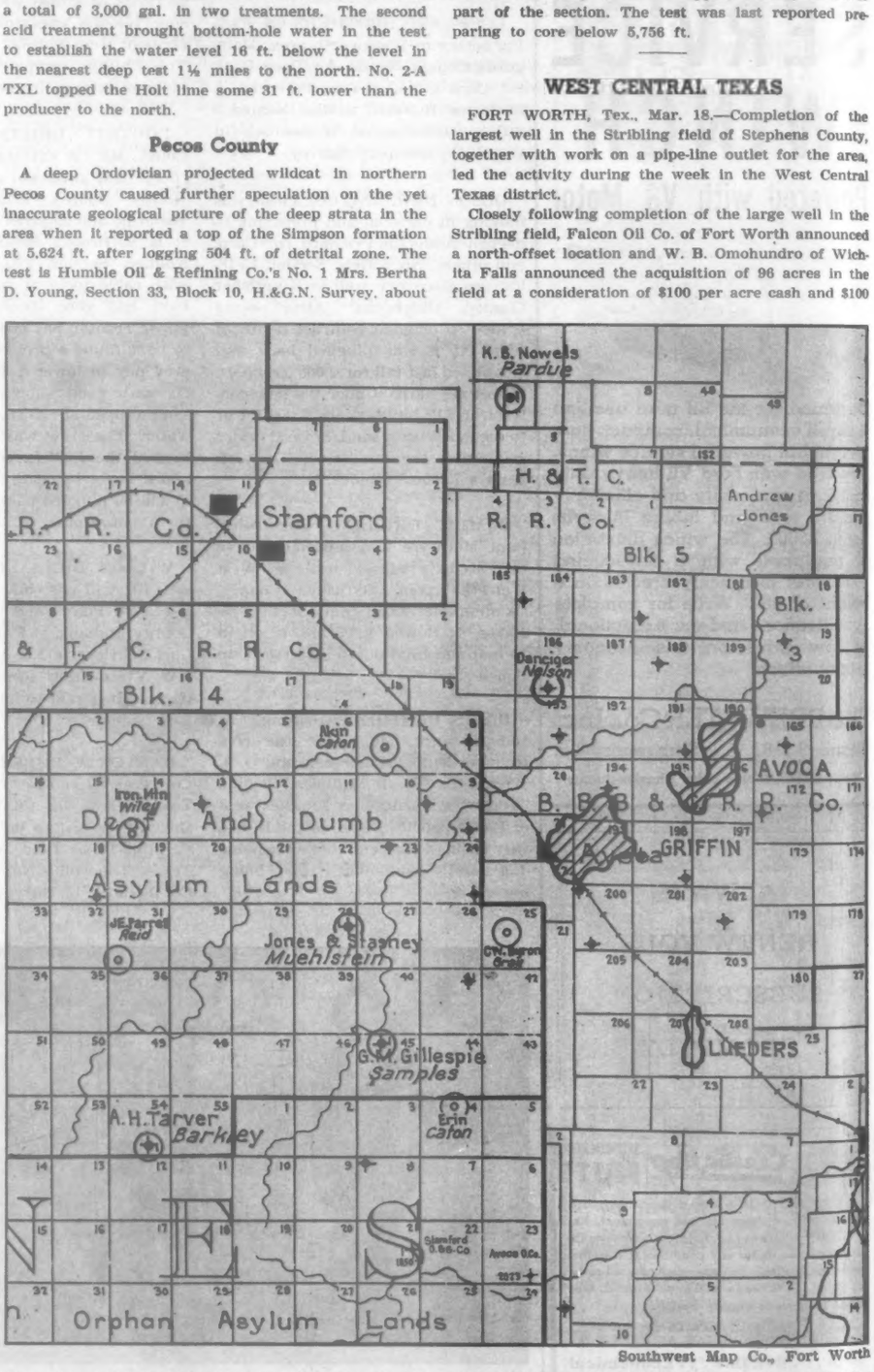
Pecos County

A deep Ordovician projected wildcat in northern Pecos County caused further speculation on the yet inaccurate geological picture of the deep strata in the area when it reported a top of the Simpson formation at 5,624 ft. after logging 504 ft. of detrital zone. The test is Humble Oil & Refining Co.'s No. 1 Mrs. Bertha D. Young, Section 33, Block 10, H.&G.N. Survey, about 8½ miles northwest of the Ellenburger producing Apco field. It was not determined whether the test entered the Simpson in the upper, middle, or lower part of the section. The test was last reported preparing to core below 5,756 ft.

WEST CENTRAL TEXAS

FORT WORTH, Tex., Mar. 18.—Completion of the largest well in the Stribling field of Stephens County, together with work on a pipe-line outlet for the area, led the activity during the week in the West Central Texas district.

Closely following completion of the large well in the Stribling field, Falcon Oil Co. of Fort Worth announced a north-offset location and W. B. Omohundro of Wichita Falls announced the acquisition of 96 acres in the field at a consideration of $100 per acre cash and $100



Southwest Map Co., Fort Worth

Several new locations during the past few weeks have increased Jones County's Palo Pinto lime wildcatting pace to near the high point of last summer. Even more wildcatting is predicted to this prolific lime stratum during these spring months

per acre in oil as produced. Starting the new spurt of activity for this steadily developing field in the northwestern part of the county was the record flow of Clyde Greathouse's No. 1 J. J. Robertson, ½-mile-east outpost to the field proper. The new well, 466 ft. from the north and west lines of the south half of Peter Norton Survey, drilled saturation from 3,551 to 3,572 ft., total depth, and landed 5½-in. casing at 3,533 ft. The test was treated with 5,000 gal. of acid after which it flowed at the rate of 100 bbl. per hour for 4 hours through open 2-in. tubing.

Late in the week Falcon Oil Co. staked a north offset as its No. 1 Robertson, to start within 10 days. Exact location has not been announced. Indicating even more development, Greathouse announced that a 10-well drilling program would be launched for his acreage surrounding the extension well.

Jones County

With Jones County's Palo Pinto lime wildcatting program little changed during the week, attention was turned to shallower wildcatting throughout the county. Five miles southeast of the Sayles field and near the Jones-Taylor county line, Lewis Production Co. is preparing to spud in its No. 1 M. T. Ramsey, a 2,000-ft. wildcat in the NE cor. Section 80, Block 14, T.&P. Survey. One mile west of the Sayles field Charles W. Danger will seek production at about 2,000 ft. in an outpost staked in the C. W. Logesden lands, SE cor. Section 39, Block 16, T.&P. Survey. On the south side of the link area between the Lewis and the Steffens fields of southeastern Jones County, Petroleum Producers Co. has staked location for No. 4 McKeown, Section 36.

WEST TEXAS FIELD COMPLETIONS

(24-hour gages)

Andrews County

Skelly Oil Co.'s No. 1-F University, 4,250-4,313 ft., 1,120 bbl.

Crane County

McElroy field: Gulf Oil Corp.'s No. 56 McElroy, 2,798-2,982 ft., 250 bbl., old well drilled deeper.

Waddell field: Gulf Oil Corp.'s No. 29 Waddell, 3,210-3,498 ft., 6,976 bbl.

Tubb field: Humble Oil & Refining Co.'s No. 2-C Tubb, 4,270-4,406 ft., 2,231 bbl.

Dunes field: Kewanee Oil Co.'s No. 6-B University, junked and abandoned at a total depth of 2,275 ft.

Ector County

Goldsmith field: American-Maracaibo's No. 3-B Scharbauer, 4,140-70 ft., 865 bbl. Gulf Oil Corp.'s No. 254 Goldsmith, 4,147-4,202 ft., 528 bbl. Gulf Oil Corp.'s No. 257 Goldsmith, 4,135-4,230 ft., 1,675 bbl. Phillips-Pure's No. 76 C. Cowden, 4,117-62 ft., 920 bbl. Shell Oil Co., Inc.'s No. 2 Woods, 4,295-4,475 ft., 1,016 bbl.

Foster field: Lee Drilling Co.'s No. 10 Johnson, 4,145-4,320 ft., 1,504 bbl. Stanolind Oil & Gas Co.'s No. 50-B E. F. Cowden, 4,025-4,180 ft., 279 bbl. Texas Pacific Coal & Oil Co.'s No. 1 J. L. Johnson, 4,120-4,280 ft., 430 bbl.

North Cowden field: Stanolind Oil & Gas Co.'s No. 1 Midland Farms, 4,400-80 ft., 234 bbl. Tide Water Associated Oil Co.'s No. 1 T. & P. Land Trust, 4,112-4,250 ft., 535 bbl.

Holt deep field: Stanolind Oil & Gas Co.'s No. 1 W. F. Cowden, top anhydrite 1,540 ft., top Yates 2,810 ft., top Brown lime 3,590 ft., top solid lime 3,835 ft., top Clear Fork series 5,142 ft., total depth 5,237 ft., plugged back for completion from 5,146-5,210 ft. for 97 bbl. oil and 60 bbl. water, pumping.

Gaines County

Seminole field: Atlantic Refining Co.'s No. 2-C Riley, 5,000-5,300 ft., 430 bbl.

Wasson field: Continental Oil Co.'s No. 4-46 Moore, 4,930-5,000 ft., 541 bbl.

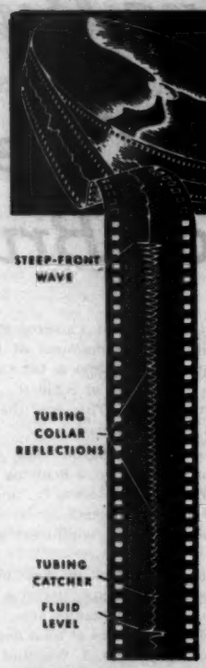
Hockley County

Slaughter field: Awoeb Oil Co.'s No. 2 Davis, 4,876-4,995 ft., 1,156 bbl.

Howard County

Chalk field: Continental Oil Co.'s No. 2-C Chalk, 2,880-2,912 ft., 528 bbl., old well drilled deeper. Merrick & Bristow's No. 3 Roberts, 2,990-82 ft., 10 bbl. oil and 30 bbl. water, old well drilled deeper. F. W. Merrick's No. 4-B M.&C. Chalk, 2,944-80 ft., 200 bbl.

(Continued on Page 101)



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The OIL AND GAS JOURNAL

TULSA, OKLAHOMA

Texas and Louisiana Gulf

By
NEIL WILLIAMS

Tide Water Opens Production On the Bay Brussel Prospect

HOUSTON, Tex., Mar. 18.—Tide Water Associated Oil Co.'s No. 1 Delta Farms, Inc., a prospective pool opener on the Bay Brussel prospect, La Fourche Parish, coastal Louisiana, which has been in the process of completion for several weeks, perforated casing at 11,310-18 ft., and the well flowed at the rate of 33 bbl. of 30-gravity oil per hour through a ¼-in. choke. A slight amount of salt water was recovered on the test, and the perforations have been squeezed off, preparatory to retesting. This well was drilled to a total depth of 11,850 ft., and casing was cemented to test a series of sands logged by an electrical survey at intervals from 8,700 to 11,400 ft. Drill-stem testing in these sands recovered distillate, gas and some salt water.

In the same parish, and approximately 1,600 ft. south of the discovery well of the La Fourche Crossing field, Mikton Oil Co.'s No. 2 Martinez was retesting at 10,025-28 ft. The well flowed an unestimated amount of distillate and gas from this sand the previous week, and had to be recompleted in an attempt to lower the gas-oil ratio. North of the discovery, Lisbon-Iberia Oil Co. is reported to be moving in materials for No. 1 Thibodaux in Section 17-15s-17e, while F. D. Scranton is scheduled to start a test in Section 16-15s-17e.

First production test of Plymouth Oil Co.'s No. 1 McHugh, Bayou Pigeon prospect, Iberia Parish, proved disappointing. Drill-stem testing through perforated casing at 8,158-86 ft., recovered salt water, and the company is preparing to retest at 8,057-71 ft., where a recent drill-stem test recovered pipe-line oil. Two other sands which tested pipe-line oil were logged at 7,727-85 ft., and 7,928-52 ft.

Will Test Erath Prospect

Drilling was started on a new location at the Erath prospect, Vermilion Parish, by G. H. Vaughan and others. The well is on the Avery Boullion lease in Section 49-13s-3e, about 1 mile east of Texas Co.'s No. 1 School Board, which is reported to have cored sufficient sands below 10,000 ft. to make a commercial producer. Lease prices have soared since the reported showing was revealed, and enough protection is held by various companies to result in an active drilling campaign should the Texas Co.'s operation make a producer.

Amerada Petroleum Corp. is preparing to complete its third producer in the Grand Lake field, Cameron Parish. Seven-inch casing was cemented in No. 5 State to test an oil sand in the 8,400-ft. horizon. Total depth of the well is 9,659 ft.

West of the South Roanoke field, Jefferson Davis Parish, Continental Oil Co. cemented a protection string of 7-in. casing in No. 1 Nibletts Farms at 10,900 ft., and the company plans to drill out cement to the total depth of 11,617 ft., and set another small string of casing and liner to test. This well made its appearance as a probable pool opener last week, when it attempted to blow out after topping a sand and sandy shale section at 11,612 ft.

A half mile east extension and a new producing horizon was established in the Woodlawn field, Jefferson Davis Parish, with the completion of Union Sulphur Co.'s No. 1 W. L. Trimble. Casing was perforated at 9,493-97 ft., and the well flowed 67 bbl. of 48-gravity distillate daily through a ¼-in. choke.

Location for another deep well on the east flank of the Starks field, Calcasieu Parish, was announced by W. T. Burton and McLean. The well is No. 2 Industrial Lumber Co. in Section 29-9s-12w, about 825 ft. west of No. 1 Industrial Lumber Co., abandoned 2 weeks ago at a total depth of 7,416 ft. The first test, attempted a blowout from a gas and at 7,215-27 ft., and an oil sand was reported logged at 7,349 ft., but was never tested due to mechanical trouble.

The west side of the Chalkley field, Cameron Parish, was further defined with the abandonment of Union Sulphur Co.'s No. 1-A Sweet Lake Land & Oil Co. An electrical survey to the total depth of 9,250 ft., failed to show any sand worth testing. This was the first well drilled in the field by the company.

On the west flank of the old Bayou Blue dome, Iberville Parish, Superior Oil Co.'s No. 2 Schwing Lumber & Shingle Co. is drilling below 6,800 ft., and has failed to find the sand recently opened by its No. 1 Schwing. Location is about 900 ft. southwest of the discovery well.

Another dry hole was apparently marked up for the Tertiary Wilcox trend, as Atlantic Refining Co.'s No. 1 Lutcher Moore Lumber Co., Juanita area, Beauregard Parish, is shut down for orders at total depth of 10,500 ft. The same company's No. 1 Whitmer, Section 26-3s-11w, is drilling in sandy shale below 8,575 ft.

Production from a new sand on the west flank of the Anse La Butte field, St. Martin Parish, was apparently opened as Iberia Petroleum Co.'s No. 1-A Moresi, is reported to have flowed 180 bbl. of 25-gravity oil per day through a 10/64-in. choke from sand at 2,440-70 ft. The well is located in Section 118, in the same area as Glassell & Glassell's No. 1 Breaux, which opened a new sand several weeks ago.

Texas Co.'s No. 1 State in the West Cote Blanche area, St. Mary Parish, was being prepared for a production test. Drilled to a total depth of 8,685 ft., 9⅝-in. casing was cemented on bottom. Shallow sands showing saturation logged at 3,109-37 ft., and 3,141-60 ft. were scheduled to be tested, and if they fail to produce, the hole is expected to be carried deeper. The well is situated west of the old Cote Blanche dome on a separate prospect.

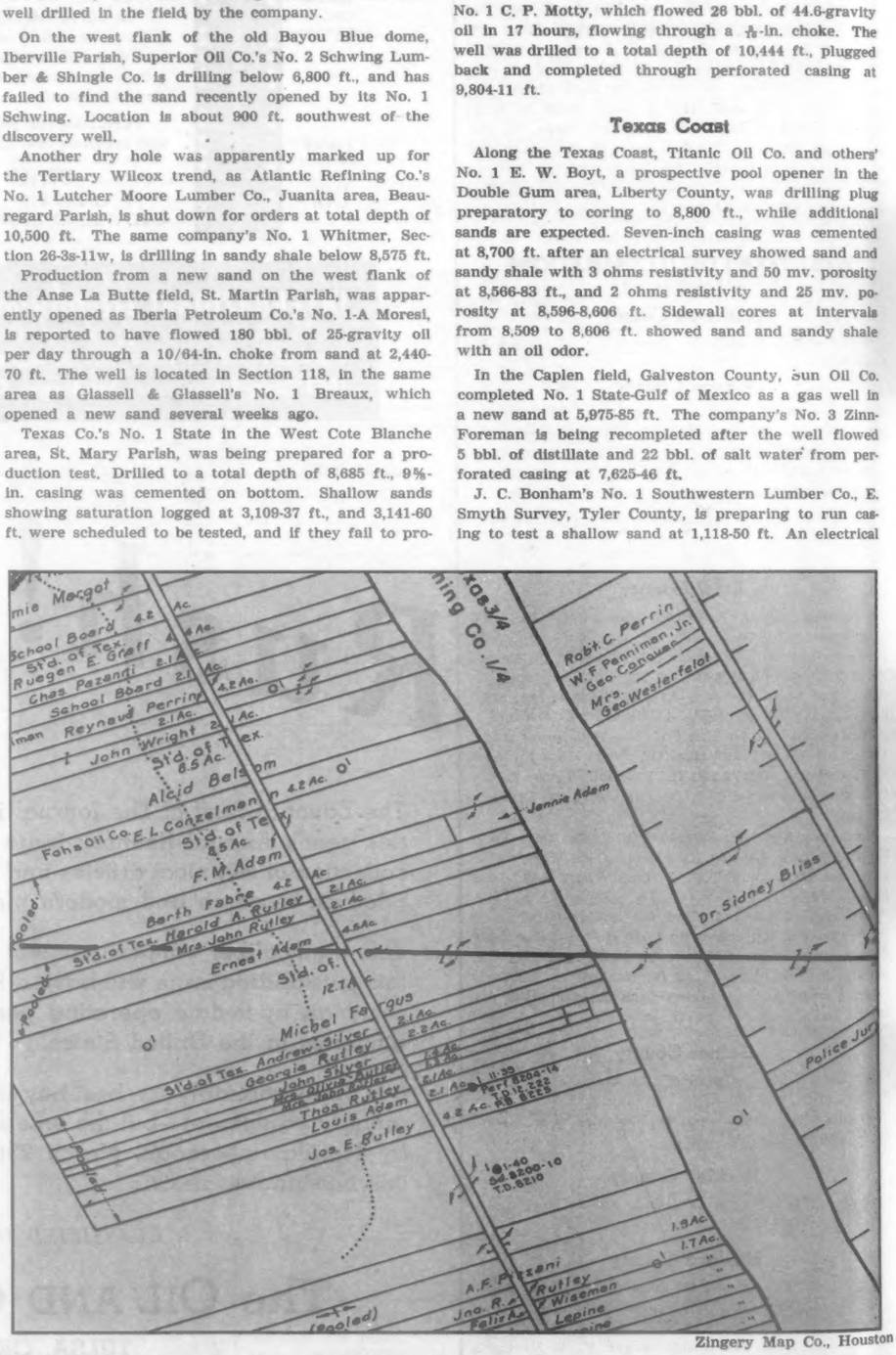
The Abbeville field, Vermilion Parish, was extended ½ mile with the completion of Continental Oil Co.'s No. 1 C. P. Motty, which flowed 26 bbl. of 44.6-gravity oil in 17 hours, flowing through a 4/64-in. choke. The well was drilled to a total depth of 10,444 ft., plugged back and completed through perforated casing at 9,804-11 ft.

Texas Coast

Along the Texas Coast, Titanic Oil Co. and others' No. 1 E. W. Boyt, a prospective pool opener in the Double Gum area, Liberty County, was drilling plug preparatory to coring to 8,800 ft., while additional sands are expected. Seven-inch casing was cemented at 8,700 ft. after an electrical survey showed sand and sandy shale with 3 ohms resistivity and 50 mv. porosity at 8,566-83 ft., and 2 ohms resistivity and 25 mv. porosity at 8,596-8,606 ft. Sidewall cores at intervals from 8,509 to 8,606 ft. showed sand and sandy shale with an oil odor.

In the Caplen field, Galveston County, Sun Oil Co. completed No. 1 State-Gulf of Mexico as a gas well in a new sand at 5,975-85 ft. The company's No. 3 Zinn-Foreman is being recompleted after the well flowed 5 bbl. of distillate and 22 bbl. of salt water from perforated casing at 7,625-46 ft.

J. C. Bonham's No. 1 Southwestern Lumber Co., E. Smyth Survey, Tyler County, is preparing to run casing to test a shallow sand at 1,118-50 ft. An electrical



Zingery Map Co., Houston

Plat of the Barataria field, Jefferson Parish, coastal Louisiana, showing recent completions and location of drilling wells

survey showed sand with 5 ohms resistivity and 50 mv. porosity. J. Z. Werby's No. 1 Hayes, J. C. Boyett Survey, is drilling in shale below 5,075 ft.

In the South China field, Jefferson County, Titanic Oil Co. was completing two wells. No. 2 Broussard, is flowing wash water and oil while cleaning out from perforated casing at 7,870-79 ft., while No. 2-B Guitterman in the north extension area is testing through perforated casing at 7,535-39 ft.

Anahuac Extended

The Anahuac field, Chambers County, was extended ⅛ mile east with the completion of Humble Oil & Refining Co.'s No. 1 Garth. The well was drilled to a total depth of 7,163 ft., and was completed through perforated casing at 7,135-43 ft., for an initial production of 403 bbl. per day flowing through a ¼-in. choke.

In the Hilje field, Mackhank Petroleum Co.'s No. 1 F. W. Wilson, about 1,300 ft. west of the discovery well, is bottomed at 5,232 ft., and casing was cemented on bottom to test sand at 5,225-32 ft.

Location for an interesting wildcat was announced for Harris County by Rowan & Nichols for No. 1 Lobit, northwest of the Cedar Bayou field, and in the B. Barrow survey.

The Anchor field, Brazoria County, was extended about 2,000 ft. southeast with the completion of Glenn McCarthy's No. 1 Galaznik. Production was obtained by perforating casing at 10,480-85 ft. The well is flowing an estimated 22 bbl. per hour through a ¼-in. choke. Gravity of the oil is 34.8°. Northwest of the discovery well, Humble Oil & Refining Co.'s No. 1 Galznik and Taylor is bottomed at 10,994 ft., and 7-in. casing was cemented at 10,822 ft.

TEXAS GULF COAST COMPLETIONS IN PROVEN FIELDS

Fort Bend County

Thompson field: Quintana Petroleum Corp.'s No. 4 Wolters, perforated casing 5,384-92 ft., and 5,400-08 ft., 356 bbl., ¼-in. choke.

Brazoria County

Manvel field: Texas Co.'s No. 23-A W. T. Belcher, 5,670 ft., 532 bbl., ¼-in. choke. West Columbia field: Texas Co.'s No. 13-J. G. Phillips, perforated casing 5,540-70 ft., 175 bbl., ¼-in. choke.

Chambers County

Anahuac field: Gulf Oil Corp.'s No. 3 Peterson, 7,139 ft., 194 bbl., ¼-in. choke. Humble Oil & Refining Co.'s No. 1-B Garth, perforated casing 7,135-45 ft., 403 bbl., ¼-in. choke.

Harris County

Clear Lake field: Humble Oil & Refining Co.'s No. 34-C Humble-West, sand 5,842-43 ft., 40 bbl., ⅛-in. choke. Fairbanks field: Gem Oil Co.'s No. 3 White, sand 6,809-31 ft., 136 bbl., ⅛-in. choke. Friendswood field; Humble Oil & Refining Co.'s No. 3 J. T. Moore, sand 6,037-47 ft., 292 bbl., ¼-in. choke. Humble field: John Deering's No. 2 Burt, 1,755 ft., 150 bbl., 18/64-in. choke.

Galveston County

Caplen field: Sun Oil Co.'s No. 1 State, perforated casing 5,975-85 ft., 1,055,000 cu. ft. dry gas, 9/64-in. choke.

Polk County

Segno field: Gulf Oil Corp.'s No. 29 Wing, sand 8,043-65 ft., 627 bbl., ¼-in. choke.

Matagorda County

Markham field: Hamill & Hamill's No. 7-B Sisk, sand 3,260-84 ft., 355 bbl., ⅜-in. choke. Orange field: Gulf Oil Corp.'s No. 5 Granger, sand 5,975-51 ft., 162 bbl., ⅛-in. choke.

Wharton County

Pickett Ridge field: Texas Co.'s No. 35-A Pierce estate, 4,793 ft., 130 bbl., ⅛-in. choke. Withers field: Texas Co.'s No. 22 Broussard, 5,538 ft., 80 bbl., ⅛-in. choke.

Jackson County

Lonnie Glasscock's No. 1-B J. H. Drummond, perforated casing 5,761-70 ft., 801 bbl., ¼-in. choke. George Greer's No. 6 Ward, perforated casing 5,725-30 ft., and 5,740-45 ft., 675 bbl., ¼-in. choke. Magnolia Pe-

(Continued on Page 100)

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Rocky Mountain Area

Large Wells in Lance Creek; New Pool in Carbon County

By

T. R. INGRAM

DENVER, Colo., Mar. 18.—First discovery of the year in the northern Rocky Mountain area was Sinclair-Wyoming Oil Co.'s No. 4-2, in the West Ferris field, Carbon County, Wyoming, which flowed 54 bbl. per day initial through the tubing from the Tensleep after plugging off bottom water.

Lance Creek had three completions, all good wells. Argo Oil Co.'s No. 12-A Elliott flowed 350 bbl. an hour through the casing and then made 140 bbl. an hour through the tubing. Principal pay was in the Joss sand. Minnelusa Oil Corp.'s No. 1 Ford, an outpost on the north, made 113 bbl. an hour from the Leo sand, and same company's No. 4 H. & M., on the south side, flowed 140 bbl. an hour through the tubing from the Leo.

Other Wyoming completions included a small well in the Plunkett field for Lincoln Oil & Gas Co. in its No. 8 Tribal, and a good Sundance sand well in Lost Soldier in Sinclair-Wyoming Oil Co.'s No. 90-A, which pumped 150 bbl. in 8 hours.

Cut Bank field in Montana had two completions. Glacier Production Co.'s No. 2 Maltby swabbed 104 bbl. in 10 hours from the Cut Bank sand, and Newel & Chandler's No. 1 Anderson, a wildcat north of the field, was a disappointment.

Wyoming had three new operations, Montana one, and Colorado none.

NEW MEXICO

A half-mile west extension to the recently opened Carter area in southeastern Lea County featured the field development of the past week in the Southeast New Mexico district.

The new extension well flowed 31 bbl. of oil in 24 hours and operators were preparing to shoot the pay section before completing the well. It is Culbertson & Irwin's No. 1 T. N. Lankford, ½ mile west of the discovery well and in the NE NW Section 25-23-36. The discovery was the same operators' No. 1 Lee Carter, NE NE Section 25-23-36, completed for 54 bbl. of oil daily in September of 1939 from a total depth of 3,641 ft. The new extension is bottomed at 3,618 ft. in lime and sand.

After the high of 21 new locations for the district 2 weeks ago, intentions to drill dropped back to normal during the past week with a total of 10 locations staked, 7 in Eddy County and 3 in Lea County. Completions also showed a decided decline over the past few weeks.

Eddy County

G. R. Burke's No. 1 State, SE cor. SE SW Sec. 36-16-24. (O.W.D.D.) S.D. 2,550 ft.
G. E. Bobb's No. 1 Vandagriff, SW NE Sec. 6-19-31. (O.W.D.D.)
Everts' No. 1 Greer, SE cor. Sec. 31-16-31. C.O. 3,650 ft.; 700 ft. O.I.H.; T.D. 3,854 ft.; tstg.
Everts & Moran's No. 1 Ranuz, NE NW Sec. 18-23-26. T.D. 375 ft.; S.D.
J. B. Cowden's No. 1 State, SW SE Section 3-17-29, between Root field and High Lonesome field. M.I.M.
G. A. Grober's No. 1 Wright, 1,080 ft. from N and W lines, Sec. 25-18-28. Tstg. S.O.&G. 1,382 ft.; est. 10 B.O.P.D.; tstg. 1,735 ft.
Artesia Drlg. Co.'s No. 1 Hoffman, SE SE SE Sec. 14-17-24. W.O.C. 860 ft.
L. E. Elliott's No. 1 Elliott, SE SE SE Sec. 24-18-29. S.S.O. 3,255-75 ft.; S.D.O. 3,482 ft.; made 1 B.O. and 4 B.W. in 24 hrs.; tstg.
J. W. Elliott's No. 1 Cannon (O.W.D.D.), C SW SE Sec. 4-19-30. S.D.O. 3,421 ft.; sulf. wtr.
Trojan Oil Co.'s No. 1 Grant, SW SW NE Sec. 33-20s-25e. S.O. 1,530 ft.; S.D.R. 1,580 ft.
Dodson Drlg. Co.'s No. 1 A. H. McElreath, 330 ft. from S and W lines, Sec. 3-16-29, 2½ mi. NE of Nolen's pool opener. Est. 175,000 cu. ft. gas; S.D.O. 2,750 ft.
Anderson's No. 1 Neeson, 330 ft. from W and 2,310 ft. from N lines, Sec. 4-16-30. Drlg. 2,760 ft.
Carper Drlg. Co.-Tallmadge's No. 2-A Miles-State, 2,310 ft. N and E lines, Sec. 32-17-30. S.D.R. 2,882 ft.; oil sd. 2,864-92 ft.
Clark & Cooper's No. 1 Gates, 1,980 ft. S and E lines, Sec. 20-16-27. Drlg. 1,515 ft.
A. E. Frazier's No. 1 H. E. Yates, 330 ft. from N and 1,650 ft. from E lines, Sec. 6-20-27. S.D. 817 ft.
Frederick's No. 1 Reed, 1,980 ft. from S and W lines, Sec. 28-24-38 (O.W.D.D.). Est. 1,500,000 cu. ft. gas at 2,300 ft.; W.O.C. 2,893 ft.
Jack Harris' No. 1 Josey, 370 ft. from S and 2,310 ft. from W lines, Sec. 20-20-23, R.U. and S.D.
Wilder's No. 1 Young, 1,650 ft. from N and W lines, Sec. 23-16-29. S.G. 1,805 ft.; drlg. 2,785 ft.
Sam Montgomery's No. 1 Kaltenback, 330 ft. from N and W lines, Sec. 24-16-27. Drlg. 2,075 ft.
Sam Weiner's No. 1 Hess, 330 ft. from S and E lines. Sec. 9-16-29. S.D.R. 1,925 ft.
Thomas & Bowers' No. 1 H. W. Etz, 2,310 ft. from N and 330 ft. from W lines, Sec. 13-16-30. Drlg. 2,634 ft.

Dona Ana County

Picacho O. & G. Co.'s No. 12 Armstrong, Sec. 15-23s-1w. Rng. csg. 2,620 ft.
Slack & Mahres' No. 1 Simmons, Sec. 35-22s-5e. T.D. 2,785 ft.; S.D.O.

Chaves County

Comanche Drlg. Co.'s No. 4 Sloop & Purcell, 510 ft. from N line and 330 ft. from E line, Sec. 5-11-26. Tstg. 1,268-74 ft., S.S.O.; 90 ft. O.I.H. in 12 hrs.
Farrar-Jones-Cunningham's No. 1 Samples, 330 ft. from S and E lines, Sec. 1-7-27. S.D.R. 98 ft.
G. H. Cowden's No. 1 Brunson, 330 ft. from N and W lines, Sec. 27-9s-30e. S.D. bond 225 ft.
Grastorff-Caudill & French's No. 1-A Smith (O.W.D.D.). Sec. 1-4-29. S.D.R. 3,686 ft.
Helmes & Martin's No. 1 Stephens, 660 ft. from N and 1,980 ft. from E lines, Sec. 22-15-29. S.D.O. 1,835 ft.
T. S. Stanfield's No. 1 Bogle, 330 ft. N line and 2,310 ft. E line, Sec. 27-13-25. U.R. 1,151 ft.

Luna County

O. D. Berry's No. 1 Berry, SE SE SW Sec. 33-22s-10w. S.D.O. 1,000 ft.; no report.
O. D. Berry's No. 2 Berry, Sec. 33-22-10. Drlg. 136 ft.

Lea County

Culbertson & Irwin's No. 1 Lankford, 660 ft. from N and 1,980 ft. from W lines, Sec. 25-23-36. Gas from 2,955-3,007 ft.; increased to 75,000,000 cu. ft. per day at 3,030 ft.; oil pay 3,605-18 ft., T.D.; flwd. 31 B.O. in 24 hrs.; prep. shoot.
J. D. Barefield's No. 2 Stroup, 1,980 ft. from N and E lines, Sec. 12-18-32. S.D.; new engine; 1,480 ft.
Stogner & Weiner's No. 1 State, SE SE Sec. 30-12-32. Spudded.

Otero County

Ernest's No. 1 Ernest, Sec. 20-25-7. S.D.R. 2,740 ft.
Otero Oil Co.'s No. 1 State, SE NW Sec. 5-22-10. C.O. 560 ft.; T.D. 825 ft.

Socorro County

Joiner Oil Corp.'s No. 1 Belen grant, 2,310 ft. N and W lines, Sec. 16-3-1. S.D. 600 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

In the Loco Hills field, Helen B. Bowers' No. 1 State, SE cor. NW SW Section 1-18-29, pay from 2,683-2,709 ft., flowed 240 bbl. daily after shot.

Lea County

In the Langlie field, Gulf Oil Corp.'s No. 2-E Arnott-Ramsey, SW SE Section 16-25-37, flowed 15,000,000 cu. ft. sour gas daily, naturally, from 2,980-3,153 ft. Skelly Oil Co.'s No. 3 J. W. Sherrell, NE cor. NW NE Section 6-25-37, pay from 3,415-90 ft., flowed 69 bbl. daily after shot.

NORTHWEST NEW MEXICO

Bernalillo County

Norins Realty Co., Inc.'s No. 2 North Albuquerque, NE SE NW Sec. 19-11n-4e. S.D. 4,710 ft.
Norins Realty Co., Inc.'s No. 2 Pajarito, Sec. 22-9n-1e. S.D. 2,000 ft.

McKinley County

Petroleum Products Corp.'s No. 7 Hospah, C SW SW Sec. 36-18n-9w. Spd. to 50 ft. and S.D. acct. of weather.

San Juan County

Continental Oil Co.'s No. 104 Rattlesnake, NE SE SW Section 12-29n-19w, Rattlesnake field, was completed in the Dakota at 826 ft., total depth, for 25 bbl. per day on the pump. Testing still is in progress on the Continental's deep test, No. 100 Rattlesnake. After cleaning out to 6,720 ft., plugged depth, it set the tester at 6,610 ft. It was open for 12 hours and showed a small quantity of air, but no water or oil. The bridge at 6,720 ft. then was drilled out and tubing has been run and packer set for another test.

Kutz Deep Test, Inc.'s No. 1 Govt., C NW NW Sec. 28-28n-10w. Drlg. 675 ft.
Angel Peak Oil Co.'s No. 9 fee, C NE NW Sec. 24-28n-11w. T.D. 1,870 ft.; prep. to complete; est. 3,000,000 cu. ft. gas.
Continental Oil Co.'s No. 100 Rattlesnake, SE NW NE Sec. 2-29n-19w. T.D. 7,407 ft.; tstg.

San Miguel County

Ben E. Keith's No. 1-X McCune, SW SE SW Sec. 32-16n-12e. Drlg. 1,590 ft. in gr. sh.

Socorro County

Joiner Oil Corp.'s No. 1 Belen Grant, SE NW Sec. 16-3n-1e. Cmtd. 10-in. at 585 ft. and S.D.

Valencia County

C. A. Grober et al's No. 1 Fuqua, NE NE Sec. 19-5n-3e. T.D. 3,850 ft.; prep to run 7-in.

COLORADO

El Paso County

F. F. Hintze et al's No. 1 State, CEL SE SE Sec. 16-11s-60w, S.D. 895 ft. (C.D.); to run 8-in.

Huerfano County

I. E. Sideman-White et al's No. 1 Martinez, C SW NE Sec. 33-26n-67w. Drlg. below 650 ft.

La Plata County

Nick Spatter's No. 1-X Bryce, C SW SW Sec. 31-33n-9w. S.D. 3,090 ft. for drlg. line.

Larimer County

Ed Shogren et al's No. 1 Frazier, SE Sec. 31-4n-69w. S.D. 450 ft.
L. R. Steele et al's No. 1 Mundt, NE NE NE Sec. 7-3n-69w. Drlg. 1,948 ft.; est. 750,000 cu. ft. gas in basal Hygiene at 1,915 ft.; built up to 143 lb. pressure after standing over night, but declined rapidly.

Montezuma County

McElmo Oil Co.'s No. 1 West, NE NW NE Sec. 31-36n-17w. Drlg. 5,285 ft. in blk. L.&sh.; S.S.O.; est. 2,000,000 cu. ft. gas at 5,241 ft.

Park County

South Park Oil Co.'s No. 1 Lemar, NE NE SE Sec. 34-11s-75w. T.D. 7,172 ft.; sdtrkg. bit.

Moffat County

Great Divide Pet. Co.'s No. 1 Wyatt, SE Sec. 4-6n-92w. S.D. 724 ft.; 10-in. froze at 650 ft.; will res. as soon as weather conditions improve.

Routt County

L. C. Craig-E. L. Moore's No. 1-X Erwin, C SW NE Sec. 33-7n-85w. T.D. 2,220 ft.; trying to recmt. 6⅝-in. at 2,055 ft.

Washington County

Thurman Oil Tr.'s No. 1 Ruby, NW NW SW Sec. 3-5s-52w. T.D. 1,360 ft.; delayed by weather.

Directors of Kinney-Coastal Oil Co. advised the stockholders in their annual report that the company is operating at a profit, but that dividends can not be paid until the accumulated deficits of past years have been eliminated and that it will best serve the dividend objective and other constructive purposes to reduce the authorized capital from $5,000,000 to $250,000 by changing the par value from $1 to 5 cents per share. A resolution to that effect will be submitted to the stockholders at the annual meeting March 28. Net current assets have increased from $42,080 in 1933 to $150,014 in 1939. The company has holdings in Salt Creek and Garland in Wyoming and in other states.

WYOMING

Big Horn County

Frank S. Scott's No. 1 Robertson, SE SE SE Sec. 6-54n-93w. S.D. 650 ft. indef.
Yale Oil Corp.'s No. 1 Simonson, Lot 53, Sec. 34-55n-97w. Cg. in L. at 4,312 ft.

Carbon County

The first discovery of 1940 in the northern Rocky Mountain area was chalked up to the credit of Sinclair-Wyoming Oil Co.'s No. 4-E, C SE SW Section 29-26n-87w, West Ferris field. The field produces gas in the Dakota and Sundance, but this is the first test drilled to the Tensleep. It was completed in the Tensleep at 4,295 ft., after plugging back from 4,326 ft., and swabbed 200 bbl. initial through the casing. It then flowed 54 bbl. per day through the tubing. Water was encountered in the base of the Tensleep. The 7-in. was ce-

mented in the top of the pay at 4,273 ft. The top of the Embar was at 3,950 ft. and the Sundance was at 2,546-2,650 ft. It lies just to the east of the Mahoney dome.

Ohio Oil Co.'s No. 12 State, CWL NE Sec. 34-20n-78w. Loc. (first report).
Tri-State O. & R. Co.'s No. 17 NW SE NW Sec. 20-21n-80w. S.D. 585 ft.

Converse County

Shawnee Expl. Co.'s No. 1 Salisbury, SE SW NE Sec. 27-32n-69w. Rdy. to spd.

Fremont County

Lincoln Oil & Gas Co.'s No. 8 Tribal, CEL NE SW Section 23-1s-1e, Plunkett field, was completed at 470 ft. and bailed 18 bbl. per day. It was an old well drilled by Spokane-Wyoming Oil Co. to 457 ft. and deepened by the new operator.

Pilot Oil Co.'s No. 5 Enos, CSL SE NE Sec. 21-3n-1w. Cmtd. 8¼-in. at 125 ft. W.O.C. (first report).
Tropic Oil Co.'s No. 1 Govt. C SE SW Sec. 34-27n-90w. T.D. 3,495 ft.; cmtd. off tools after sidetrkg.
F. F. Hintze's No. 1 Govt. CWL NW NW Sec. 7-28n-92w. T.D. 1,135 ft.; tstg.

Hot Springs County

Oscar B. Grace's No. 5 Govt., Lot 3, SE NW Sec. 21-43n-92w. Drlg. 430 ft.
Campbell et al's No. 2 Kyne, NW SE SW Sec. 22-43n-92w. Drlg. 385 ft.

Lincoln County

H. C. Harris et al's No. 1 Govt. SE NW NW Sec. 23-21n-117w. Drlg. 2,741 ft.
Fontenelle Dev. Co.'s No. 1 Pomroy, NE SW Sec. 5-24n-113w. T.D. 600 ft.; prep. to run 10-in.

Natrona County

General Pet. Corp.'s No. 121-G, NW NW NW Sec. 21-35n-77w. Drlg. 7,868 ft. in Thermopolis sh.

Niobrara County

Lance Creek had three completions and two near completions. The best well was Argo Oil Co.'s No. 12-A Elliott, SE SE NW Section 5-35n-65w, near the center of the field, which showed only light production in the Leo, but came in for a big well in the Joss sand. It was completed at 5,409 ft. and averaged 350 bbl. per hour for 3 hours through the casing. It then made 140 bbl. an hour through the tubing. The 7-in. was cemented in the top of the Leo at 5,163 ft., that sand showing 22 bbl. in 16 hours in a test. It was deepened to the Joss and is producing from both sands.

Minnelusa Oil Corp.'s No. 1 Ford, SW NW NE Section 33-36n-65w, an outpost well on the north, was completed in the Leo sand at 5,431 ft., total depth, for 113 bbl. per hour through the tubing. The 7-in. was cemented at 5,350 ft. Dry sand was cored at 5,359-71 ft. and saturation was picked up at 5,371 ft. It is an east offset to Argo's No. 8 Ford, completed 2 weeks ago, extending the Leo sand proven area ¼ of a mile to the north, for 1,680 bbl. through a ¾-in. choke on the tubing.

Minnelusa Oil Corp.'s No. 4 H. & M., NE NE SE Section 7-35n-65w, an outside well on the south, but located between two producers, flowed 140 bbl. an hour through the tubing at 5,542 ft., total depth, from the Leo sand topped at 5,516 ft.

Ohio Oil Co.'s No. 6 Agnes Rohlff, an outside well on the north, showed three stands of water in 1 hour in a test at 5,551-66 ft., and is preparing to drill deeper. It had the red marker at 5,475 ft.

Continental Oil Co. has gone back into its No. 6 Rodeo-4, NW NW NE Section 35, which extended the Sundance sand area on the east side when completed last July, and deepened it from 4,075 ft., where it made 380 bbl. initial, to 4,104 ft., where it is swabbing and testing.

Ohio Oil Co. is moving in rotary to drill deeper in its No. 8 Converse Sheep, which is located on the very top of the structure. It was originally completed in March 1938 for 1,500,000 cu. ft. of gas per day in the top of the Leo sand at 4,994 ft., and showing no oil in the Sundance or Converse sands. A year ago it was worked over and acidized with a total of 15,000 gal. and responded with a flow of 186 bbl. of oil and 2,000,000 cu. ft. of gas.

Ohio Oil Co.'s No. 8 State-Lamb, NW NW NW Sec. 36-36n-65w. Cmtd. 10¾-in. at 298 ft.; W.O.C. (formerly No. 7 State-Lamb).
MacKinnie O. & D. Co.-Minnelusa Oil Corp.'s No. 9 Thompson, NW SE NW Sec. 7-35n-65w. Rlg.; W.O. equip.
Continental Oil Co.'s No. 18 Tom Bell, SE NE NE Sec. 33-36n-65w. Cmtd. 10¾-in. at 305 ft.
Continental Oil Co.'s No. 7-B Dieiman, SE SE NE Sec. 7-35n-65w. Loc.
Ohio Oil Co.'s No. 16 Putnam, SW SW NW Sec. 4-35n-65w. Loc.
Continental Oil Co.'s No. 6-B Dieiman, NE SW NW Sec. 8-35n-65w. Drlg. 2,860 ft.; 10¾-in. cmtd. at 317 ft.
Minnelusa Oil Corp.'s No. 1 Joss, NE SE NW Sec. 6-35n-65w. Drlg. 5,105 ft.
Continental Oil Co.'s No. 6 Apex-O.P.C.-4, SW NW NW Sec. 35-36n-65w. B.R.
Ohio Oil Co.'s No. 14 Carrie Putnam, NW SW SW Sec. 33-36n-65w. Drlg. r.b. 4,807 ft.
Ohio Oil Co.'s No. 15 Carrie Putnam, NW NE SW Sec. 33-36n-65w. Rlg; W.O. equip.
Continental Oil Co.'s No. 10-B Schuricht, SE SE SE Sec. 6-35n-65w. Drlg. sh. 3,803 ft.; T. Dakota 3,340 ft.
Continental Oil Co.'s No. 6-A Schuricht, SE NE SE Sec. 6-35n-65w. T.D. 5,200 ft.; cmtd. 7-in. at 5,150 ft.; swbg. and prep. to acd.
Continental Oil Co.'s No. 5 Apex-O.P.C.-1, NE SW NE Sec. 34-36n-65w. T.D. 4,158 ft.; swbd. 40 bbl. through tbg. after shot; W.O. pump.
Ohio Oil Co.'s No. 6 Rohlff, SE NW NE Sec. 32-36n-65w. T.D. 5,566 ft.; tstd. wtr.; will D.D.
H. D. Moore's No. 1 Berggren, SE NW Sec. 23-35n-63w. T.D. 2,526 ft.; rng. 4½-in. for W.S.O.
Ohio Oil Co.'s No. 8 Converse Sheep, NW SE SW Sec. 32-36n-65w. T.D. 4,994 ft.; M.I. rot. to D.D.

Sublette County

Marvel Oil Co.'s No. 1-H Govt., CEL NE SE Sec. 28-27n-113w. S.D. after R.U.
North La Barge Oil Co.'s No. 1 Govt., SW NE SE Sec. 8-27n-113w. T.D. 1,850 ft.; rng. 8-in. to carry.

Sweetwater County

Sinclair-Wyoming Oil Co.'s No. 90-A, SW SW NW Section 11-26n-90w. Lost Soldier field, was completed at 2,149 ft. for 150 bbl. in 8 hours from the Sundance sand on a pumping test.
Sinclair-Wyoming Oil Co.'s No. 92-A, NE NW SW Sec. 11-26n-90w. R.U.R. (first report).
Sinclair-Wyoming Oil Co.'s No. 91-A, SE NE NE Sec. 10-26n-90w. T.D. 2,001 ft.; T. Sundance 1,999 ft.; R.U.C.T.
Vermillion Oil Co.'s No. 2 Govt., SW SW SW Sec. 7-12n-99w. Drlg. 2,539 ft.

Weston County

Patterson Oil Co.'s No. 21 fee, NW SW SE Sec. 17-46n-63w. Drlg. 575 ft.
Wheedon Oil Co.'s No. 5 State, NW SW SE Sec. 16-46n-63w. Drlg. 182 ft. (first report).
Gose Oil Synd.'s No. 1, NE NE NE Sec. 28-47n-63w. Drlg. 4,963 ft.
Bruce C. Teeter's No. 1 State, C SW NE Sec. 36-32n-61w. S.D. 2,270 ft. (C.D.); may go to Bell sd.
Butcher Bros.' No. 5 SW NW NE Sec. 16-46n-63w. R.O.G.

MONTANA

Blaine County

F. J. Buscher's No. 1 Evey, C NE SE Sec. 12-32n-17e, S.D. 61 ft.

Glacier County

Cut Bank had two completions and one new operation. Glacier Production Co.'s No. 2 Maltby, C NE NE Section 8-33n-5w, swabbed 104 bbl. first 10 hours at 2,842 ft., total depth, from the Cut Bank sand at 2,795-

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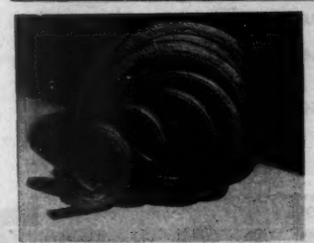

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Rocky Mountain Area

By

T. R. INGRAM

Large Wells in Lance Creek; New Pool in Carbon County

DENVER, Colo., Mar. 18.—First discovery of the year in the northern Rocky Mountain area was Sinclair-Wyoming Oil Co.'s No. 4-2, in the West Ferris field, Carbon County, Wyoming, which flowed 54 bbl. per day initial through the tubing from the Tensleep after plugging off bottom water.

Lance Creek had three completions, all good wells. Argo Oil Co.'s No. 12-A Elliott flowed 350 bbl. an hour through the casing and then made 140 bbl. an hour through the tubing. Principal pay was in the Joss sand. Minnelusa Oil Corp.'s No. 1 Ford, an outpost on the north, made 113 bbl. an hour from the Leo sand, and same company's No. 4 H. & M., on the south side, flowed 140 bbl. an hour through the tubing from the Leo.

Other Wyoming completions included a small well in the Plunkett field for Lincoln Oil & Gas Co. in its No. 8 Tribal, and a good Sundance sand well in Lost Soldier in Sinclair-Wyoming Oil Co.'s No. 90-A, which pumped 150 bbl. in 8 hours.

Cut Bank field in Montana had two completions. Glacier Production Co.'s No. 2 Maltby swabbed 104 bbl. in 10 hours from the Cut Bank sand, and Newel & Chandler's No. 1 Anderson, a wildcat north of the field, was a disappointment.

Wyoming had three new operations, Montana one, and Colorado none.

NEW MEXICO

A half-mile west extension to the recently opened Carter area in southeastern Lea County featured the field development of the past week in the Southeast New Mexico district.

The new extension well flowed 31 bbl. of oil in 24 hours and operators were preparing to shoot the pay section before completing the well. It is Culbertson & Irwin's No. 1 T. N. Lankford, ½ mile west of the discovery well and in the NE NW Section 25-23-36. The discovery was the same operators' No. 1 Lee Carter, NE NE Section 25-23-36, completed for 54 bbl. of oil daily in September of 1939 from a total depth of 3,641 ft. The new extension is bottomed at 3,618 ft. in lime and sand.

After the high of 21 new locations for the district 2 weeks ago, intentions to drill dropped back to normal during the past week with a total of 10 locations staked, 7 in Eddy County and 3 in Lea County. Completions also showed a decided decline over the past few weeks.

Eddy County

G. R. Burke's No. 1 State, SE cor. SE SW Sec. 36-16-24. (O.W.D.D.) S.D. 2,550 ft.
G. E. Bobb's No. 1 Vandagriff, SW NE Sec. 6-19-31. (O.W.D.D.)
Everts' No. 1 Greer, SE cor. Sec. 31-16-31. C.O. 3,650 ft.; 700 ft. O.I.H.; T.D. 3,854 ft.; tstg.
Everts & Moran's No. 1 Ranuz, NE NW Sec. 18-23-26. T.D. 375 ft.; S.D.
J. B. Cowden's No. 1 State, SW SE Section 3-17-29, between Root field and High Lonesome field. M.I.M.
G. A. Grober's No. 1 Wright, 1,080 ft. from N and W lines, Sec. 25-18-28. Tstg. S.O.&G. 1,382 ft.; est. 10 B.O.P.D.; tstg. 1,735 ft.
Artesia Drlg. Co.'s No. 1 Hoffman, SE SE SE Sec. 14-17-24. W.O.C. 860 ft.
L. E. Elliott's No. 1 Elliott, SE SE SE Sec. 24-18-29. S.S.O. 3,255-75 ft.; S.D.O. 3,482 ft.; made 1 B.O. and 4 B.W. in 24 hrs.; tstg.
J. W. Elliott's No. 1 Cannon (O.W.D.D.), C SW SE Sec. 4-19-30. S.D.O. 3,421 ft.; sulf. wtr.
Trojan Oil Co.'s No. 1 Grant, SW SW NE Sec. 33-20s-25e. S.O. 1,530 ft.; S.D.R. 1,580 ft.
Dodson Drlg. Co.'s No. 1 A. H. McElreath, 330 ft. from S and W lines, Sec. 3-16-29, 2½ mi. NE of Nolen's pool opener. Est. 175,000 cu. ft. gas; S.D.O. 2,750 ft.
Anderson's No. 1 Neeson, 330 ft. from W and 2,310 ft. from N lines, Sec. 4-16-30. Drlg. 2,760 ft.
Carper Drlg. Co.-Tallmadge's No. 2-A Miles-State, 2,310 ft. N and E lines, Sec. 32-17-30. S.D.R. 2,882 ft.; oil sd. 2,864-92 ft.
Clark & Cooper's No. 1 Gates, 1,980 ft. S and E lines, Sec. 20-16-27. Drlg. 1,815 ft.
A. E. Frazier's No. 1 H. E. Yates, 330 ft. from N and 1,650 ft. from E lines, Sec. 6-20-27. S.D. 817 ft.
Frederick's No. 1 Reed, 1,980 ft. from S and W lines, Sec. 28-24-38 (O.W.D.D.). Est. 1,500,000 cu. ft. gas at 2,300 ft.; W.O.C. 2,893 ft.
Jack Harris' No. 1 Josey, 370 ft. from S and 2,310 ft. from W lines, Sec. 20-20-23, R.U. and S.D.
Wilder's No. 1 Young, 1,650 ft. from N and W lines, Sec. 23-16-29, S.G. 1,805 ft.; drlg. 2,785 ft.
Sam Montgomery's No. 1 Kaltenback, 330 ft. from N and W lines, Sec. 24-16-27. Drlg. 2,075 ft.
Sam Weiner's No. 1 Hess, 330 ft. from S and E lines. Sec. 9-16-29. S.D.R. 1,925 ft.
Thomas & Bowers' No. 1 H. W. Etz, 2,310 ft. from N and 330 ft. from W lines, Sec. 13-16-30. Drlg. 2,634 ft.

Dona Ana County

Picacho O. & G. Co.'s No. 12 Armstrong, Sec. 15-23s-1w. Rng. csg. 2,620 ft.
Slack & Mahres' No. 1 Simmons, Sec. 35-22s-5e. T.D. 2,785 ft.; S.D.O.

Chaves County

Comanche Drlg. Co.'s No. 4 Sloop & Purcell, 510 ft. from N line and 330 ft. from E line, Sec. 5-11-26. Tstg. 1,268-74 ft., S.S.O.; 90 ft. O.I.H. in 12 hrs.
Farrar-Jones-Cunningham's No. 1 Samples, 330 ft. from S and E lines, Sec. 1-7-27. S.D.R. 98 ft.
G. H. Cowden's No. 1 Brunson, 330 ft. from N and W lines, Sec. 27-9s-30e, S.D. bond 225 ft.
Grastorff-Caudill & French's No. 1-A Smith (O.W.D.D.). Sec. 1-4-29. S.D.R. 3,686 ft.
Helmes & Martin's No. 1 Stephens, 660 ft. from N and 1,980 ft. from E lines, Sec. 22-15-29. S.D.O. 1,835 ft.
T. S. Stanfield's No. 1 Bogle, 330 ft. N line and 2,310 ft. E line, Sec. 27-13-25. U.R. 1,151 ft.

Luna County

O. D. Berry's No. 1 Berry, SE SE SW Sec. 33-22s-10w. S.D.O. 1,000 ft.; no report.
O. D. Berry's No. 2 Berry, Sec. 33-22-10. Drlg. 136 ft.

Lea County

Culbertson & Irwin's No. 1 Lankford, 660 ft. from N and 1,980 ft. from W lines, Sec. 25-23-36. Gas from 2,955-3,007 ft.; increased to 75,000,000 cu. ft. per day at 3,030 ft.; oil pay 3,605-18 ft., T.D.; flwd. 31 B.O. in 24 hrs.; prep. shoot.
J. D. Barefield's No. 2 Stroup, 1,980 ft. from N and E lines, Sec. 12-18-32. S.D.; new engine; 1,480 ft.
Stogner & Weiner's No. 1 State, SE SE Sec. 30-12-32. Spudded.

Otero County

Ernest's No. 1 Ernest, Sec. 20-25-7. S.D.R. 2,740 ft.
Otero Oil Co.'s No. 1 State, SE NW Sec. 5-22-10. C.O. 560 ft.; T.D. 825 ft.

Socorro County

Joiner Oil Corp.'s No. 1 Belen grant, 2,310 ft. N and W lines, Sec. 16-3-1. S.D. 600 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Eddy County

In the Loco Hills field, Helen B. Bowers' No. 1 State, SE cor. NW SW Section 1-18-29, pay from 2,683-2,709 ft., flowed 240 bbl. daily after shot.

Lea County

In the Langlie field, Gulf Oil Corp.'s No. 2-E Arnott-Ramsey, SW SE Section 16-25-37, flowed 15,000,000 cu. ft. sour gas daily, naturally, from 2,980-3,153 ft. Skelly Oil Co.'s No. 3 J. W. Sherrell, NE cor. NW NE Section 6-25-37, pay from 3,415-90 ft., flowed 69 bbl. daily after shot.

NORTHWEST NEW MEXICO

Bernalillo County

Norins Realty Co., Inc.'s No. 2 North Albuquerque, NE SE NW Sec. 19-11n-4e. S.D. 4,710 ft.
Norins Realty Co., Inc.'s No. 2 Pajarito, Sec. 22-9n-1e. S.D. 2,000 ft.

McKinley County

Petroleum Products Corp.'s No. 7 Hospah, C SW SW Sec. 36-18n-9w. Spd. to 50 ft. and S.D. acct. of weather.

San Juan County

Continental Oil Co.'s No. 104 Rattlesnake, NE SE SW Section 12-29n-19w, Rattlesnake field, was completed in the Dakota at 826 ft., total depth, for 25 bbl. per day on the pump. Testing still is in progress on the Continental's deep test, No. 100 Rattlesnake. After cleaning out to 6,720 ft., plugged depth, it set the tester at 6,610 ft. It was open for 12 hours and showed a small quantity of air, but no water or oil. The bridge at 6,720 ft. then was drilled out and tubing has been run and packer set for another test.

Kutz Deep Test, Inc.'s No. 1 Govt., C NW NW Sec. 28-28n-10w. Drlg. 675 ft.
Angel Peak Oil Co.'s No. 9 fee, C NE NW Sec. 24-28n-11w. T.D. 1,870 ft.; prep. to complete; est. 3,000,000 cu. ft. gas.
Continental Oil Co.'s No. 100 Rattlesnake, SE NW NE Sec. 2-29n-19w. T.D. 7,407 ft.; tstg.

San Miguel County

Ben E. Keith's No. 1-X McCune, SW SE SW Sec. 32-16n-12e. Drlg. 1,590 ft. in gr. sh.

Socorro County

Joiner Oil Corp.'s No. 1 Belen Grant, SE NW Sec. 16-3n-1e. Cmtd. 10-in. at 585 ft. and S.D.

Valencia County

C. A. Grober et al's No. 1 Fuqua, NE NE Sec. 19-5n-3e. T.D. 3,850 ft.; prep to run 7-in.

COLORADO

El Paso County

F. F. Hintze et al's No. 1 State, CEL SE SE Sec. 16-11s-66w, S.D. 895 ft. (C.D.); to run 8-in.

Huerfano County

I. E. Sideman-White et al's No. 1 Martinez, C SW NE Sec. 33-26n-67w. Drlg. below 650 ft.

La Plata County

Nick Spatter's No. 1-X Bryce, C SW SW Sec. 31-33n-9w. S.D. 3,090 ft. for drlg. line.

Larimer County

Ed Shogren et al's No. 1 Frazier, SE Sec. 31-4n-69w. S.D. 450 ft.
L. R. Steele et al's No. 1 Mundt, NE NE NE Sec. 7-3n-69w. Drlg. 1,948 ft.; est. 750,000 cu. ft. gas in basal Hygiene at 1,915 ft.; built up to 143 lb. pressure after standing over night, but declined rapidly.

Montezuma County

McElmo Oil Co.'s No. 1 West, NE NW NE Sec. 31-36n-17w. Drlg. 5,285 ft. in blk. L.&sh.; S.S.O.; est. 2,000,000 cu. ft. gas at 5,241 ft.

Park County

South Park Oil Co.'s No. 1 Lemar, NE NE SE Sec. 34-11s-75w. T.D. 7,172 ft.; sdtrkg. bit.

Moffat County

Great Divide Pet. Co.'s No. 1 Wyatt, SE Sec. 4-6n-92w. S.D. 724 ft.; 10-in. froze at 650 ft.; will res. as soon as weather conditions improve.

Routt County

L. C. Craig-E. L. Moore's No. 1-X Erwin, C SW NE Sec. 33-7n-85w. T.D. 2,220 ft.; trying to recmt. 6⅝-in. at 2,055 ft.

Washington County

Thurman Oil Tr.'s No. 1 Ruby, NW NW SW Sec. 3-5s-52w. T.D. 1,360 ft.; delayed by weather.

Directors of Kinney-Coastal Oil Co. advised the stockholders in their annual report that the company is operating at a profit, but that dividends can not be paid until the accumulated deficits of past years have been eliminated and that it will best serve the dividend objective and other constructive purposes to reduce the authorized capital from $5,000,000 to $250,000 by changing the par value from $1 to 5 cents per share. A resolution to that effect will be submitted to the stockholders at the annual meeting March 28. Net current assets have increased from $42,080 in 1933 to $150,014 in 1939. The company has holdings in Salt Creek and Garland in Wyoming and in other states.

WYOMING

Big Horn County

Frank S. Scott's No. 1 Robertson, SE SE SE Sec. 6-54n-93w. S.D. 650 ft. indef.
Yale Oil Corp.'s No. 1 Simonson, Lot 53, Sec. 34-55n-97w. Cg. in L. at 4,312 ft.

Carbon County

The first discovery of 1940 in the northern Rocky Mountain area was chalked up to the credit of Sinclair-Wyoming Oil Co.'s No. 4-E, C SE SW Section 29-26n-87w, West Ferris field. The field produces gas in the Dakota and Sundance, but this is the first test drilled to the Tensleep. It was completed in the Tensleep at 4,296 ft., after plugging back from 4,326 ft., and swabbed 200 bbl. initial through the casing. It then flowed 54 bbl. per day through the tubing. Water was encountered in the base of the Tensleep. The 7-in. was ce-

mented in the top of the pay at 4,273 ft. The top of the Embar was at 3,950 ft. and the Sundance was at 2,546-2,650 ft. It lies just to the east of the Mahoney dome.

Ohio Oil Co.'s No. 12 State, CWL NE Sec. 34-20n-78w. Loc. (first report).
Tri-State O. & R. Co.'s No. 17 NW SE NW Sec. 20-21n-80w. S.D. 585 ft.

Converse County

Shawnee Expl. Co.'s No. 1 Salisbury, SE SW NE Sec. 27-32n-69w. Rdy. to spd.

Fremont County

Lincoln Oil & Gas Co.'s No. 8 Tribal, CEL NE SW Section 23-1s-1e, Plunkett field, was completed at 470 ft. and bailed 18 bbl. per day. It was an old well drilled by Spokane-Wyoming Oil Co. to 457 ft. and deepened by the new operator.

Pilot Oil Co.'s No. 5 Enos, CSL SE NE Sec. 21-3n-1w. Cmtd. 8¾-in. at 125 ft. W.O.C. (first report).
Tropic Oil Co.'s No. 1 Govt. C SE SW Sec. 34-27n-90w. T.D. 3,495 ft.; cmtd. off tools after sidetrkg.
F. F. Hintze's No. 1 Govt. CWL NW NW Sec. 7-28n-92w. T.D. 1,135 ft.; tstg.

Hot Springs County

Oscar B. Grace's No. 5 Govt., Lot 3, SE NW Sec. 21-43n-92w. Drlg. 430 ft.
Campbell et al's No. 2 Kyne, NW SE SW Sec. 22-43n-92w. Drlg. 385 ft.

Lincoln County

H. C. Harris et al's No. 1 Govt. SE NW NW Sec. 23-21n-117w. Drlg. 2,741 ft.
Fontenelle Dev. Co.'s No. 1 Pomroy, NE SW Sec. 5-24n-113w. T.D. 600 ft.; prep. to run 10-in.

Natrona County

General Pet. Corp.'s No. 121-G, NW NW NW Sec. 21-35n-77w. Drlg. 7,868 ft. in Thermopolis sh.

Niobrara County

Lance Creek had three completions and two near completions. The best well was Argo Oil Co.'s No. 12-A Elliott, SE SE NW Section 5-35n-65w, near the center of the field, which showed only light production in the Leo, but came in for a big well in the Joss sand. It was completed at 5,409 ft. and averaged 350 bbl. per hour for 3 hours through the casing. It then made 140 bbl. an hour through the tubing. The 7-in. was cemented in the top of the Leo at 5,163 ft., that sand showing 22 bbl. in 16 hours in a test. It was deepened to the Joss and is producing from both sands.

Minnelusa Oil Corp.'s No. 1 Ford, SW NW NE Section 33-36n-65w, an outpost well on the north, was completed in the Leo sand at 5,431 ft., total depth, for 113 bbl. per hour through the tubing. The 7-in. was cemented at 5,350 ft. Dry sand was cored at 5,359-71 ft. and saturation was picked up at 5,371 ft. It is an east offset to Argo's No. 8 Ford, completed 2 weeks ago, extending the Leo sand proven area ¼ of a mile to the north, for 1,680 bbl. through a ¾-in. choke on the tubing.

Minnelusa Oil Corp.'s No. 4 H. & M., NE NE SE Section 7-35n-65w, an outside well on the south, but located between two producers, flowed 140 bbl. an hour through the tubing at 5,542 ft., total depth, from the Leo sand topped at 5,516 ft.

Ohio Oil Co.'s No. 6 Agnes Rohlff, an outside well on the north, showed three stands of water in 1 hour in a test at 5,551-66 ft., and is preparing to drill deeper. It had the red marker at 5,475 ft.

Continental Oil Co. has gone back into its No. 6 Rodeo-4, NW NW NE Section 35, which extended the Sundance sand area on the east side when completed last July, and deepened it from 4,075 ft., where it made 380 bbl. initial, to 4,104 ft., where it is swabbing and testing.

Ohio Oil Co. is moving in rotary to drill deeper in its No. 8 Converse Sheep, which is located on the very top of the structure. It was originally completed in March 1938 for 1,500,000 cu. ft. of gas per day in the top of the Leo sand at 4,994 ft., and showing no oil in the Sundance or Converse sands. A year ago it was worked over and acidized with a total of 15,000 gal. and responded with a flow of 186 bbl. of oil and 2,000,000 cu. ft. of gas.

Ohio Oil Co.'s No. 8 State-Lamb, NW NW NW Sec. 36-36n-65w. Cmtd. 10¾-in. at 298 ft.; W.O.C. (formerly No. 7 State-Lamb).
MacKinnie O. & D. Co.-Minnelusa Oil Corp.'s No. 9 Thompson, NW SE NW Sec. 7-35n-65w. Rlg.; W.O. equip.
Continental Oil Co.'s No. 18 Tom Bell, SE NE NE Sec. 33-36n-65w. Cmtd. 10¾-in. at 305 ft.
Continental Oil Co.'s No. 7-B Dielman, SE SE NE Sec. 7-35n-65w. Loc.
Ohio Oil Co.'s No. 16 Putnam, SW SW NW Sec. 4-35n-65w. Loc.
Continental Oil Co.'s No. 6-B Dielman, NE SW NW Sec. 8-35n-65w. Drlg. 2,860 ft.; 10¾-in. cmtd. at 317 ft.
Minnelusa Oil Corp.'s No. 1 Joss, NE SE NW Sec. 6-35n-65w. Drlg. 5,105 ft.
Continental Oil Co.'s No. 6 Apex-O.P.C.-4, SW NW NW Sec. 35-36n-65w. B.R.
Ohio Oil Co.'s No. 14 Carrie Putnam, NW SW SW Sec. 33-36n-65w. Drlg. r.b. 4,807 ft.
Ohio Oil Co.'s No. 15 Carrie Putnam, NW NE SW Sec. 33-36n-65w. Rlg; W.O. equip.
Continental Oil Co.'s No. 10-B Schuricht, SE SE SE Sec. 6-35n-65w. Drlg. sh. 3,803 ft.; T. Dakota 3,340 ft.
Continental Oil Co.'s No. 6-A Schuricht, SE NE SE Sec. 6-35n-65w. T.D. 5,200 ft.; cmtd. 7-in. at 5,150 ft.; swbg. and prep. to acd.
Continental Oil Co.'s No. 5 Apex-O.P.C.-1, NE SW NE Sec. 34-36n-65w. T.D. 4,158 ft.; swbd. 40 bbl. through tbg. after shot; W.O. pump.
Ohio Oil Co.'s No. 6 Rohlff, SE NW NE Sec. 32-36n-65w. T.D. 5,566 ft.; tstd. wtr.; will D.D.
H. D. Moore's No. 1 Berggren, SE NW Sec. 23-35n-63w. T.D. 2,526 ft.; rng. 4½-in. for W.S.O.
Ohio Oil Co.'s No. 8 Converse Sheep, NW SE SW Sec. 32-36n-65w. T.D. 4,994 ft.; M.I. rot. to D.D.

Sublette County

Marvel Oil Co.'s No. 1-H Govt., CEL NE SE Sec. 28-27n-113w. S.D. after R.U.
North La Barge Oil Co.'s No. 1 Govt., SW NE SE Sec. 8-27n-113w. T.D. 1,850 ft.; rng. 8-in. to carry.

Sweetwater County

Sinclair-Wyoming Oil Co.'s No. 90-A, SW SW NW Section 11-26n-90w. Lost Soldier field, was completed at 2,149 ft. for 150 bbl. in 8 hours from the Sundance sand on a pumping test.

Sinclair-Wyoming Oil Co.'s No. 92-A, NE NW SW Sec. 11-26n-90w. R.U.R. (first report).
Sinclair-Wyoming Oil Co.'s No. 91-A, SE NE NE Sec. 10-26n-90w. T.D. 2,001 ft.; T. Sundance 1,999 ft.; R.U.C.T.
Vermillion Oil Co.'s No. 2 Govt., SW SW SW Sec. 7-12n-99w. Drlg. 2,539 ft.

Weston County

Patterson Oil Co.'s No. 21 fee, NW SW SE Sec. 17-46n-63w. Drlg. 575 ft.
Wheedon Oil Co.'s No. 5 State, NW SW SE Sec. 16-46n-63w. Drlg. 182 ft. (first report).
Gose Oil Synd.'s No. 1, NE NE NE Sec. 28-47n-63w. Drlg. 4,963 ft.
Bruce C. Teeter's No. 1 State, C SW NE Sec. 36-32n-61w. S.D. 2,270 ft. (C.D.); may go to Bell sd.
Butcher Bros.' No. 5 SW NW NE Sec. 16-46n-63w. R.O.G.

MONTANA

Blaine County

F. J. Buscher's No. 1 Evey, C NE SE Sec. 12-32n-17e. S.D. 61 ft.

Glacier County

Cut Bank had two completions and one new operation. Glacier Production Co.'s No. 2 Maltby, C NE NE Section 8-33n-5w, swabbed 104 bbl. first 10 hours at 2,842 ft., total depth, from the Cut Bank sand at 2,795-

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2,840 ft. The main pay was at 2,823-40 ft. The Sunburst at 2,750-60 ft. was dry.

Newell & Chandler's No. 1 Anderson, C NE NW Section 1-36n-6w, a wildcat to the north of the field, proved to be a disappointment. It had the Sunburst sand at 2,990-3,002 ft. and a drill-stem test showed for 500,000 cu. ft. of gas. The upper Cut Bank at 3,061-81 ft. and the lower Cut Bank at 3,081-88 ft. then were cored. It then cut chert sand and conglomerate carrying water at 3,088-91 ft. There was a show of oil at 3,081-88 ft. and on a drill-stem test made 25 ft. of oil and 273 ft. of water in 2 hours. Elevation 4,072 ft.

Texas Co.'s No. 4 Tweedy, C SE NW Sec. 21-35n-6w. Loc. (first report).
Texas Co.'s No. 1 Unit, 11, C NE SW Sec. 11-35n-6w. R.U.
Annand Hutchings' No. 4 Federal Land Bank, 2,310 ft. from W and 2,310 ft. from S lines, Sec. 11-34n-6w. R.U.
Santa Rita O. & G. Co.'s No. 10 Tribal, NW NW NW Sec. 15-35n-6w. Drlg. 1,075 ft.
A. B. Cobb's No. 5 Van Demark, CSL SE NE Sec. 35-35n-6w. Loc.
A. B. Cobb's No. 5 Walberger, CNL NE SE Sec. 35-35n-6w. R.O.G.
Glacier Prod. Co.'s No. 1 Barrington, CSL NE SW Sec. 19-33n-5w. T.D. 2,990 ft.; fsg. bailer.
Glacier Prod. Co.'s No. 1 Evans, C SW NE Sec. 21-33n-5w. Drlg. 2,825 ft.
Santa Rita O. & G. Co.'s No. 4 Stahl, CSL NW SE Sec. 20-33n-5w. Drlg. 1,675 ft.
British American Oil Co.'s No. 12 Tribal, C SE NW Sec. 34-35n-6w. T.D. 2,885 ft.; fsg. tools.
R. C. Tarrant's No. 5 State, NW NE SE Sec. 36-34-6w. T.D. 2,380 ft., fsg. tools.
Helmac, Tr.'s No. 3 Govt., Lot 3, Sec. 32-33n-5w. R.O.G.
Cobb-Reagan's No. 4 Jackson, SW SW SE Sec. 5-32n-6w. R.U.R.

Toole County

Prevol & Shay's No. 5 Govt., SE NW SW Sec. 11-35n-3w. Drlg. 1,059 ft.; 8¼-in. cmtd. at 1,030 ft.
Coolidge & Coolidge's No. 3 McCurdy, SE NW SW Sec. 2-35n-3w. Drlg. 1,870 ft.; Sunburst dry.
Mosby Oil Corp.'s No. 3 Pederson, SE NW SE Sec. 7-35n-2w. T.D. 1,678 ft.; tstg.
Casper T. Olen's No. 9 Engemoen, NW NE NW Sec. 14-35n-2w. S.D. 70 ft.
L. J. Yealy's No. 14 Shaw, NW SW NE Sec. 35-36n-2w. R.O.G.
Superior Pet. Co.'s No. 3 Haugen, C NE NE Sec. 11-35n-3w. Drlg. 1,510 ft.
Lemac Oil Co.'s No. 1 C NE NE Sec. 27-36n-2w. T.D. 1,906 ft.; contact 1,900-06 ft.; good S.O. in sdy. L.; S.D.

UTAH

Grand County

Reeder Corp.'s No. 1 State, NE NE NE Sec. 16-22s-19e. Drlg. 1,040 ft.

Summit County

Longwell Pet. Co.'s No. 1, SE SW SE Sec. 35-3n-5e. T.D. 3,274 ft.; tstg. S.O. in sd. at 3,256-74 ft.

SOUTH DAKOTA

Butte County

Two Top O. & G. Co.'s No. 2 SE NE Sec. 30-10n-6e. S.D. 2,147 ft. for repairs.

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Indiana Fields

(Continued from Page 80)

Keck, C E½ NW NW Section 34-3s-14w, had 300 ft. of oil in the hole before the shot and 500 ft. of oil in the hole after a 20-qt. shot at 2,784-99 ft. The crew was cleaning out.

Gibson County

In Gibson County Continental Oil Co.'s No. 4 Keck, SE SW SW Section 26-3s-14w, total depth 2,517 ft., was shot with 30 qt. on bottom and oil rose in the hole 1,900 ft. Continental Oil Co.'s No. 1 Kleiderer, NW SE NW Section 25-3s-14w, total depth 3,001 ft., was plugged back to 2,778 ft. and shot with 40 qt. at 2,762-78 ft. It was shut down for lack of sufficient storage. Continental's No. 5 Keck, SE SE SW Section 27-3s-14w, had Aux Vases sand at 2,784-2,801 ft., and shot it with 35 qt. Oil rose in the hole 2,400 ft.; cleaning out. O. F. Kelley and others were drilling at 1,748 ft. in No. 1 Hahn, SE SW NW Section 1-7s-12w. J. W. Chamberlain's No. 1 Shawhan, in Donation 121, Township 1s-10w, was drilling at 650 ft.

Papoose Oil Co.'s No. 2 Cooper C, NE NW SW Section 18-3s-13w, topped Cypress sand at 2,488 ft., and set pipe at 2,48 ft., total depth 2,493 ft. O'Mara and others spudded in No. 1 Maier, SE NE SW Section 21-3s-13w. Continental Oil Co. had 1,900 ft. of oil in the hole in No. 4 Keck, SE SW SW Section 26-3s-14w, after a shot of 30 qt. on bottom; total depth 2,517 ft. Fotiades and others were drilling at 495 ft. in No. 1 Gates, C E½ W½ NE Section 29-3s-12w. Midwest Development Co.'s No. 1 Brock, SE SW SE Section 10-2s-9w, was drilling at 1,200 ft. Sloss & Wells' No. 1 College, NW NE SE Section 13-2s-9w, was drilling at 1,276 ft.

In Dubois County Indiana-Illinois Petroleum Corp. was drilling at 655 ft. in No. 1 Schipp, NE NE SE Section 1-3s-5w. Cypress sand was topped at 515 ft.

In Daviess County Fred L. Hartman's No. 1 White, C W½ NW NW SW Section 22-2n-7w, was dry and abandoned at 1,540 ft., and his No. 3 White, SW NW SW Section 22-2n-7w, was dry and abandoned at 378 ft.

In Martin County Harrison Development Co.'s No. 1 Lewis, NW NW SE Section 27-5n-3w, topped Devonian lime at 1,230 ft., and was drilling at 2,250 ft.

In Jackson County Favorite Oil & Gas Co.'s No. 1 Shortridge, SE NE SW Section 27-5n-3e, topped Devonian lime at 496 ft. and was abandoned as dry at 750 ft.

In Sullivan County Salem Oil Co.'s No. 1 Woodward, NW NW NW Section 7-8n-9w, was junked and abandoned at 1,625 ft. It had been drilled to 1,700 ft. and plugged back to 1,600 ft.

In Pike County Newton Pipe Line Co.'s No. 1 Crow, C NE NE Section 24-1n-9w, was at a total depth of 1,243 ft., and running 6-in. casing.

Spencer County

In Spencer County O. L. Sturbois and others' No. 1 Boyd, C NE NE Section 31-7s-6w, pumped 33 bbl. of oil and 10 bbl. of water and produced 431,000 cu. ft. of gas the first day. On the second day it produced 41 bbl. of oil and 4 bbl. of water, together with the gas. Gas pay was at 915-18 ft. and oil pay at 922-30 ft. It was completed.

In Spencer County Kentucky Natural Gas Co. spudded No. 1 Scamahorn, C NE NW Section 29-7s-6w (corrected location). Damron, Kentucky Natural Gas Co., and Gulf Refining Co.'s No. 1 Miller-Axton, C W½ NE SE Section 30-7s-6w, was rigged up. Snell and others' No. 1 Biggerstaff, SW SW SE Section 6-7s-7w, total depth 1,061 ft., was plugged back to 1,056 ft., and pumped nothing but water. Snell and others' No. 1 Crowder, NW cor. SW NW Section 7-7s-7w, was shut down at 975 ft. with the hole full of water. Troy Refining Co.'s No. 4 Anderson, NW SE NE Section 11-6s-4w, had Barlow sand at 794 ft., and a pay at 799-806 ft. Oil rose in the hole 120 ft., also a little water; preparing to shoot. Ohio Oil Co.'s No. 1 Holtzman, NE SE SE Section 28-4s-4w, was drilling at 910 ft.

In Greene County Commonwealth Oil Co.'s No. 1 Tucker, NW cor. SE NE Section 16-6n-6w, corrected location, was drilling at 150 ft.

In Vanderburg County John Knapp and others' No. 1 Nagle, NW NW SE Section 8-6s-11w, drilling at 710 ft.

Kansas Developments

By DAL DALRYMPLE

Stoltenberg Pool, Ellsworth County Three-Way Extension

The Stoltenberg pool in Ellsworth County, Kansas, was extended in three directions in the past week; two shallow pools were in prospect in Sedgwick County. Two miles north of Clearwater, in western Sedgwick County and about 10 miles southwest of the Wichita city limits, Sunray Oil Co.'s No. 1 McMinn, CWL NW NW Section 14-29-2w, drilled into Arbuckle lime to a total depth of 4,100 ft. and found it dry. An electrical survey of the drill hole was made, which found saturation in upper formations. The company had 5½-in. casing set at 3,570 ft. and cable tools were being rigged up to test the well in Kansas City lime. Another, and at this writing a more definite discovery in the relatively shallow horizon, was made by Fuller & Starck's No. 1 Stilt, CSL SE NE Section 21-27-1w, 2 miles west of the Wichita city limits, which found a lime pay at 2,798 to 2,802 ft., total depth, the hole filling 400 ft. with oil in a few hours. Drilling was continued. The pay is considered to be Kansas City lime, which was topped at 2,655 ft.

In the three-way extension to the Stoltenberg pool in Ellsworth County Atlantic Refining Co., Duwe & Farris and others and Duwe & Farris participated. The Atlantic Refining Co.'s No. 1-E Stoltenberg, Section 17-16-10w, gave the field a ¾-mile extension southeastward if indications in the form of saturated dolomite are to be relied on. Duwe & Farris' No. 1-B Boye, in Section 9-16-10w, swabbed 50 bbl. per hour, extending the field northward ¼ mile, and Duwe & Farris and others' No. 1 Adamek, Section 17-16-10w, appears to have made a ¾-mile-west extension. All three wells should be completed this week.

Phillips Petroleum Co.'s No. 1 Wondra, CWL SW NE Section 15-17-12w, Barton County, which had a showing of oil and water in the Arbuckle at 3,319-20 ft. and was plugged back to 3,054 ft. and cement drilled out to 3,090 ft., was given a pumping test and produced 47 bbl. of oil in 4 hours. It is a wildcat south of the Kraft pool.

Near Completions

Schneider & Pulse's No. 1 Ernsting, CEL SE SW Section 6-20-11w, Barton County, pumped 80 bbl. of oil on a 24-hour test from Arbuckle dolomite, total depth 3,335 ft.

Wilson, Fortier and Alpine Oil Co.'s No. 1 Petz, CEL NW SE Section 7-20-11w, in the Ellinwood pool in Barton County, tested Arbuckle dolomite at a total depth of 3,343 ft., the well swabbing 20 bbl. of oil per hour. It had not been acidized.

Phillips Petroleum Co.'s No. 1 Weber, SW SW NW Section 13-16-12w, in the Feltes pool in Barton County, produced 6 bbl. per hour on a production test from Arbuckle dolomite, total depth 3,335 ft.

Atlantic Refining Co. and Sinclair Prairie Oil Co.'s No. 1 C. V. Smith, SE SE NW Section 33-33-4e, a Cowley County wildcat, topped Mississippi lime at 3,256 ft. and was drilling at 3,270 ft. It missed the Bartlesville sand and had had no showing thus far. It is a wildcat between Arkansas City and McCollum gas fields.

Willis L. Hartman and Arthur Brewer made location for a wildcat southeast of the Rock pool in Cowley County. The well will be known as No. 1 Falkingham, CNL NW SE Section 22-30-4e.

Stoltenberg Extensions

In Ellsworth County Duwe & Farris and others' outpost, No. 1 Adamek, CSL SW NW Section 17-16-10w, ¾ mile west of the Stoltenberg pool, topped the Arbuckle at 3,365 ft. and cored to 3,372 ft., and recovered good saturation and porosity. Six-inch casing was cemented preparatory to a production test.

Duwe & Farris' No. 1-B Boye, C W½ NW SW Section 9-16-10w, ¼ mile north of the Stoltenberg pool, got the top of the Arbuckle at 3,359 ft. and drilled to 3,363 ft. Casing was set, the plug drilled out, and the well put on the swab. It made 50 bbl. per hour without an acid treatment. It will be completed this week.

Atlantic Refining Co.'s No. 1-E Stoltenberg, CNL NW SE Section 27-16-10w, ¾ mile southeast of production in the Stoltenberg field, got the top of the Arbuckle at 3,272 ft., total depth 3,276 ft. Five-inch casing was set at 3,271 ft. The 4-ft. core showed saturation. H. V. Elwell had a showing of oil in No. 1 Adamek, CSL SW NW Section 17-16-10w, ½ mile west of the Stoltenberg pool in Arbuckle lime, topped at 3,365-71 ft., total depth. Casing was set.

In McPherson County Republic Natural Gas Co.'s No. 2-A McMillan, C S½ SE SW Section 7-20-5w, an offset to the North Bornholdt discovery well, was drilling at 3,155 ft. Same company's No. 1 Knackstedt, SW NW Section 30-20-5w, was 4 ft. in the chat at 3,279 ft. Standard tools were being rigged up to drill in.

Cowley County

Three wells were completed in the Hittle pool of Cowley County. Texas Co.'s No. 12 Hittle, NE NW SE Section 21-31-4, produced from the Arbuckle topped at 3,277 ft.; initial potential was 3,744 bbl. of oil, pumped in 24 hours; total depth, 3,286 ft. Same company's No. 11 Hittle, SW NE SE Section 21-31-4, topped Arbuckle at 3,321 ft., total depth 3,335 ft., and on a pumping test made a potential of 3,752 bbl. of oil. Hawkeye Oil Co.'s No. 6 Hittle, SE SW NE Section 21-31-4, found Arbuckle at 3,286 ft., set 7-in. casing at 3,265 ft. and pumped 3,798 bbl. of oil in 24 hours; total depth, 3,297 ft.

Ellsworth County

Three wells were completed in the Stoltenberg pool of Ellsworth County. Gulf Oil Corp.'s No. 5 Voboda, C E½ SE SE Section 8-16-10w, topped Arbuckle pay at 3,384 ft.; 5½-in. casing set, and depthograph potential made 2,551 bbl. of oil; total depth, 3,388 ft. Indian Territory Illuminating Oil Co.'s No. 2 Boye, CWL NW NW Section 16-16-10w, had Arbuckle at 3,366 ft., total depth at 3,372 ft., and made 3,000 bbl. daily potential, maximum allowable. Stanolind Oil & Gas Co.'s No. 1 Schraeder, C E½ NE NE Section 28-16-10w, had Arbuckle from 3,298-3,316 ft., total depth, and pumped 457 bbl. of oil cutting 2 per cent water.

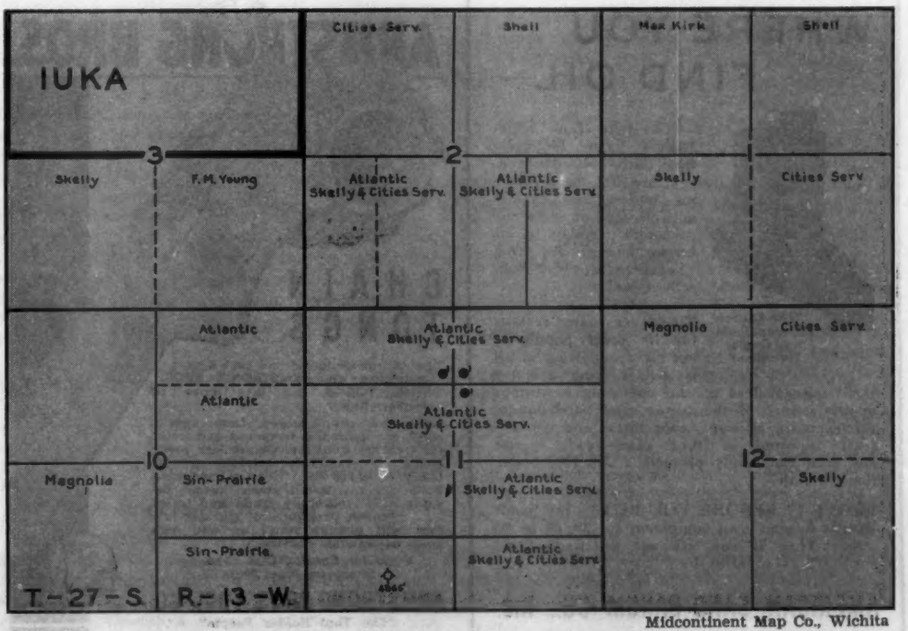
Estimated Daily Production

Estimated daily production for Kansas for the week ended March 16, and for the preceding week was as follows:

	Barrels	
	Mar. 16	Mar. 9
Oxford City	700	700
Burrton	9,100	9,000
Ritz-Canton	4,250	4,000
Graber	3,250	2,400
Hollow-Nikkel	1,600	1,500
Lerado	650	850
Voshell	1,600	1,550
Wellington	1,850	1,700
Ellsworth County:		
Lorraine	1,700	1,700
Other pools	2,170	1,230
Rice-Barton counties:		
Bloomer	4,700	3,250
Chase	5,200	4,450
Geneseo	5,050	3,350
Raymond	550	700
Silica	15,300	13,600
Keesling	450	1,200
Wherry	4,500	3,400
Miscellaneous Rice	1,220	5,535
Miscellaneous Barton	9,410	6,690
Trapp district	14,500	11,700
Balance Russell County	16,350	14,570
Sedgwick County	3,400	3,100
Ellis County:		
Bemis	6,950	6,200
Miscellaneous	6,430	3,420
Kingman County	850	840
Stafford County	6,040	6,050
Greenwood County	7,600	7,750
El Dorado	7,300	7,250
Other fields	34,080	36,815
Total Kansas	176,750	163,500

Ellis County

Gulf Oil Corp.'s No. 9 Mai, NW SE Section 14-11-17w,



Midcontinent Map Co., Wichita

A ½-mile eastward extension of the Iuka pool, Pratt County, will be sought at Magnolia Petroleum Co.'s No. 1 Beck, C W½ NW NW Section 12-27-13w. Rotary rig was being built

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Bemis pool, was completed in the Arbuckle at total depth of 3,367 ft., with pay topped at 3,359 ft. The well pumped 15 bbl. a day.

Dickey Oil Co.'s No. 6 Carmichael, S½ NE NW Section 18-11-17w, had Arbuckle at 3,347 ft., was acidized and completed for top allowable potential of 3,000 bbl. daily. Total depth was 3,355 ft.

Lario Oil & Gas Co.'s No. 2 Koerner, S½ NW SW Section 11-12-18w, Walters pool, penetrated Arbuckle lime from 3,674 to 3,679 ft. and after treatment of 500 gal. of acid made top allowable daily potential of 3,000 bbl. of oil.

Barton County

Gulf Oil Corp.'s No. 2 Howard, N½ NW SW Section 8-20-11w, Ellinwood area, topped Arbuckle at 3,290-3,306 ft., total depth, and was completed for maximum allowable of 3,000 bbl. of oil daily.

Stanolind Oil & Gas Co.'s No. 5 Thomas, E½ E½ SW Section 35-19-11w, Silica pool, reworked the Arbuckle at 3,284 ft., set 5-in. casing at 3,286 ft., acidized and pumped 197 bbl. of oil daily. Total depth was 3,292 ft.

Aylward Production Co. and others' No. 1 Bird, C SE NW Section 33-18-15w, Albert district, had total depth of 3,463 ft., was shot and made 15 bbl. of oil daily.

Rice County

Derby Oil Co. and others' No. 3 Atherton, E½ NW NE Section 30-13-14w, Atherton area, found Arbuckle pay from 3,308-15 ft., total depth, acidized and made an echometer potential of 561 bbl. of oil daily.

Stanolind Oil & Gas Co.'s No. 4-B Krug, N½ SE SE Section 27-14-14w, Gurney pool, found Lansing lime at 2,930 ft., granite wash at 3,169 ft.; total depth at 3,185 ft., and was abandoned with no shows.

Rose & Son's No. 2 Hathaway, NW SE NW Section 34-19-10w, Chase pool, pumped 102 bbl. of oil daily from Arbuckle lime at 3,311 ft. Total depth was 3,317 ft.

Meridian Oil Co.'s No. 4 Johnson, CWL SE Section 31-20-7w, Hauschild area, reached conglomerate pay at 3,311-20 ft., total depth, set 5-in. casing at 3,309 ft., and made bomb potential of 1,193 bbl. of oil.

Miscellaneous completions for the week were as follows:

In Rooks County, Zurich pool, Superior Oil Corp.'s No. 1-A Johnson, SW SE Section 26-10-19w, pumped 15 bbl. of oil daily from Lansing lime at 3,275 ft.; total depth, 3,487 ft.

Skelly Oil Co.'s No. 1-B Krehbiel, C S½ N½ SW Section 1-28-11w, Cunningham pool of Pratt County, had gas in the Viola at 4,207 ft., acidized and gaged 29,400,000 cu. ft. in 24 hours; total depth 4,223 ft.

Stelbar Oil Co.'s No. 8 Frankum, S½ NW NE Section 32-31-1w, Wellington pool of Sumner County, had pay in the Mississippi at 3,654 ft., bottomed at 3,692 ft., and pumped 295 bbl. of oil initially.

Stevens County Oil & Gas Co.'s No. 1 Leonard, a wildcat in C Section 3-32-38w, Stevens County, reached gas sand at 2,440 ft., treated with 8,000 gal. and gaged 20,000,000 cu. ft. of gas.

Continental Oil Co.'s No. 4 Chavez, CWL NE Section 20-21-1w, Graber pool, McPherson County, topped Hunton at 3,304 ft., had total depth at 3,345 ft., and pumped 189 bbl. of oil in 24 hours.

Forest City Basin

ST. JOSEPH, Mo., Mar. 18.—Muddy roads continue to delay field activity in northwestern Missouri and other sectors of the Forest City basin.

T. E. Baldwin's No. 1-A Johnson, NW NE NE Section 21-65-15w, Schuyler County, Missouri, near Queen City, was bottomed at 1,505 ft. in Arbuckle lime. Six-inch casing was being pulled. Operators may test a showing of oil found at 724-31 ft. after casing is pulled, or may abandon this wildcat and drill another test to the 724-ft. horizon at a nearby location.

Rodgers & Morrow have started drilling again at their No. 1 Seamster, Section 6-65-13w, Schuyler County, and are making hole below 905 ft. Work has been resumed at two shallow tests in Adair County, northeastern Missouri.

George Vincent and others' No. 1 Dillingham, C NE SW Section 16-53-34w, Platte County, was deepened to 1,055 ft. and shut down to run 8-in. casing to Mississippi lime.

In the Leavenworth County, Kansas, sector of the basin, Davis Brothers Drilling Co. of Independence,

(Continued on Page 102)

Eastern Field Report

By STAFF CORRESPONDENT

Clay County, West Virginia, Reports Near-Record Gasser

PITTSBURGH, Pa., Mar. 18.—An extremely large gas well was completed in West Virginia this week by the Pittsburgh & West Virginia Gas Co. on the Ruth Huling farm in Otter district, Clay County. In the Big Injun sand, total depth 1,798 ft., it gaged 30,000,000 cu. ft. a day and, when finally brought under control and shut in, a later gage showed over 20,000,000 cu. ft. a day open flow with a rock pressure of 440 lb. in 24 hours. This is one of the largest Injun sand wells on record.

In Buffalo district of Clay County, West Virginia, this company also reached the pay in No. 7724 P. M. Summers and others and at 1,807 ft., the Injun sand, an unexpectedly large column of 7,500,000 cu. ft. a day was ignited and burned down the rig. It was successfully shut in.

During the week completions in the lower eastern fields totaled 34, of which 7 were dry holes, 19 gas wells, and 8 producers with a daily initial production of 63 bbl.

SOUTHEAST OHIO

In Knox County R. C. A. and others completed the test on the John S. Fry farm in Section 6, Clay Township, in the Clinton sand at 2,661 ft., gaging 150,000 cu. ft.

In Licking County C. A. Davis and others completed a test on the Cal Woodruff farm in Section 7, Eden Township, in the lime at 2,165 ft., gaging 115,000 cu. ft. It is close to the Morgan Township line.

In Medina County E. R. Edson & Co. completed another fair well in the second test on the Samuel Brent farm in Tract 17, Lot 2, Chatham Township. It was completed in the Berea grit at 481 ft. and produced 45 bbl. the first day after shot.

In this township Thornton Producing Corp. continued its water-flooding program with several wells on the Sanford & Watson lease, Tract 10, Lot 3. Nos. 3-F, 7-F, 8-F, and 13-F are producers completed at 404, 375, 372, and 388 ft., respectively, good for 1 bbl. a day. No. 022 is an input well completed at 396 ft.

In Morgan County Gas Producing Co. of Ohio drilled a test on the Arthur Printz farm, SW Section 22, York Township, through the Medina sand to 3,900 ft. It was dry in both the Clinton and Medina sands.

In Noble County, Kennonsburg Oil & Gas Co. completed a second test on the Eugene B. Ward farm in Section 2, Wayne Township, at 720 ft., the Cow Run sand. It produced 8 bbl. the first day after shot. In the same section this company drilled a test on the James E. Hart farm to the same formation and 735 ft. and it was dry. In the SE Section 32, Enoch Township, Merry & Skinner completed a test on the E. B. Fogle farm in the 50-Foot sand at 520 ft. It has a showing of oil but the water volume is large. It may be produced, however.

SOUTHWEST PENNSYLVANIA

Nine completions were reported in Southwest Pennsylvania but no new production. In Allegheny County Equitable Gas Co. drilled on the J. Hickman farm in South Fayette Township through the Elizabeth sand to 2,955 ft. and it was dry. Walters and others are spudding the second test on the John H. Flick farm and Robert Marshall is rigging up No. 4 William Rittman. Both are in West Deer Township.

Armstrong County

In Cowanshannock Township, Armstrong County, T. W. Phillips Gas & Oil Co. completed the second test on the Jacob Boyer farm at 3,605 ft., the Bradford sand, and it was plugged to the Thirty-foot sand with 84,000 cu. ft. This company drilled a second test on the Harry Boyer farm through the Bradford sand and it was dry. It is also drilling at 3,557 ft. in the John McKinney test.

In this township, Peoples Natural Gas Co. is drilling at 1,575 ft. in the A. S. Rearick test; 757 ft. in the Frank Smith test, and moving in for No. 2 Lee Bell. Apollo Gas Co. is fishing tools in the Hulda Bleakney test after shot.

In Boggs Township John Wray and others drilled on the David White farm to 1,555 ft. through the Murraysville sand and it is dry. Humphries-Stone-McCall Corp. is down 590 ft. on the W. A. Dill farm.

In Kittanning Township, Equitable Gas Co. completed the test on the N. D. Heilman farm at 3,419 ft., the Bradford sand, and it has 134,000 cu. ft. John Wray and others are drilling at 1,290 ft. in the Benjamin Miller test. In Wayne Township Penn Wayne Gas Co. is drilling at 1,900 ft. in the Seymore Paunch test. In South Buffalo Township W. A. Baker is down 1,890 ft. in the James Bush test. In Plum Creek Township T. W. Phillips Gas & Oil Co. is drilling at 1,105 ft. in the James Cesnar test; Equitable Gas Co. is building rig for the Agnes Prugh test; Shelocta Oil & Gas Co. is drilling at 240 ft. in the Virginia Schaeffer test.

Clarion-Indiana-Westmoreland

In Clarion County, G. W. Hall is drilling at 2,550 ft. in the C. Fairman test and Owens Illinois Glass Co. at 1,625 ft. in the Alb Dietrick test, both in Limestone Township. In Porter Township, T. Swartzfager and others are down 2,190 ft. in the C. A. Swartzfager test. In Red Bank Township, Apollo Gas Co. is drilling No. 3 Lewis Keck at 425 ft.

In Indiana County T. W. Phillips Gas & Oil Co. is drilling at 1,525 ft. in No. 2 N. M. Spence and 1,105 ft. in No. 2 fee and Tomb, both in Washington Township. In White Township it is drilling at 445 ft. in the W. H. Leech test and 280 ft. in the J. J. McClain test.

In Westmoreland County Apollo Gas Co. is fishing a bit at 1,048 ft. in the D. M. Jones heirs test in Allegheny Township. Peoples Natural Gas Co. is rigging up for the H. G. Zimmerman test and cleaning out at 2,110 ft. in No. 1 H. F. Burgman.

Fayette-Greene

In German Township, Fayette County, Wahler Power Oil & Gas Co. completed the Martin Gray test at 2,462 ft. with the Fifth sand at 2,234-64 ft. and 200,000 cu. ft. of gas at 2,233-47 ft. Greensboro Gas Co. is drilling at 1,258 ft. in the Hicks and Holland test.

In Nicholson Township, Fayette County, Duquesne Gas Co. completed No. 3 John Demaske at 2,428 ft., with the Fifth sand at 2,392-2,428 ft. and 569,000 cu. ft. of gas at 2,398 ft. Greensboro Gas Co. is building rig for the S. Kopsey test and moving in rig for the Emmet Diamond test. In German Township Wahler Power Oil & Gas Co. is moving in a machine on the Felix Valerio farm.

In Greene County Judson Bell and others are moving rig on the Samuel Black farm in Monongahela Township near their large Injun sand gas well. In Richhill Township O. I. Dille and others are drilling at 950 ft. in the Madison Hughes test. In Greene Township Equitable Gas Co. is down 835 ft. in No. 2 Hugh Keenan.

Washington County

In South Franklin Township, Washington County, Foley & Williams completed No. 3 Rankin Clark at 1,378 ft. with the gas sand at 1,262-1,309 ft. and 180,000 cu. ft. at 1,279-1,304 ft. Shivers and others deepened No. 1 Thomas J. Horne to 2,554 ft. with the Ganyz and Fifty-foot sand at 2,494 ft. and 300,000 cu. ft. at 2,536-46 ft. Harry Wiliams and others deepened No. 7 Jason Buchanan to 1,440 ft. and plugged back to the Little Dunkard and oil at 1,047 ft., where it will make about 2 bbl. a day. Burleigh Wright is drilling at 1,085 ft. in the Holmes Andrews test. In Hanover Township H. K. Aten is down 1,430 ft. in No. 2 Lee Devitt. In Robinson Township R. M. Duden and others shot the Hundred-foot sand at 2,300 ft. on the Herman Baiers farm and is cleaning out.

Deep Tests

On Laurel Ridge in Stewart Township, Fayette County, New Penn Development Co., William E. Snee, and E. G. Mueller are drilling at 6,085 ft. on the Gregg L. Nell farm. In North Union Township, New Penn Development Co. and William E. Snee have started deepening No. 1 Piedmont Coal Co. from 6,800 ft., where it has been putting about 1,300,000 cu. ft. of gas in the line from the Onondaga chert beds. In Maryland these operators have not been able to drill past the obstruction in the test on the Humberson farm on the Accident dome in Garret County. The present depth is now back to 4,647 ft.

In Beaver County John T. Galey and others have reached 4,922 ft. deepening the James Tennis Oriskany gas well to the Clinton sand. It is in South Beaver Township and the present formation, shale with shells, has softened up.

WEST VIRGINIA

One small producer was completed in West Virginia. In Calhoun County Ira Bickerstaff completed the test on the F. B. Busch farm in Sheridan district at 1,876 ft., the Salt sand, good for 5 bbl. a day.

Gas Wells

In Boone County Owens-Libby-Owens Gas Department completed No. 24 Allen and Prior, in Scott district, at 2,371 ft. with a gage of 47,000 cu. ft. from the Big lime and 103,000 cu. ft. from the Berea sand.

In Cabell County G. L. Meabon and others completed the Emily Bledsoe test in McComas district at 3,470 ft., with a gage of 200,000 cu. ft. after shot.

In Gilmer County Pittsburgh & West Virginia Gas Co. completed No. 7727 J. R. Lynch, in Glenville district, at 2,277 ft., with the Big Injun at 1,918-2,057 ft. and 65,000 cu. ft. of gas at 2,025-53 ft.

In Lincoln County Wysong & Jaynes deepened No. 1 R. D. Adkins, in Jefferson district, starting at 2,489 ft. Brown shale was at 3,538-3,845 ft., and it is putting 126,900 cu. ft. in the line against a pressure of 125 lb. United Fuel Gas Co. completed deepening No. 2281 L. R. Sweetland, with 130,000 cu. ft. of gas at 3,380-90 and 3,415-25 ft.

In Wayne County United Fuel Gas Co. completed No. 4865 George Stepp, in Lincoln district, gaging 3,706,000 cu. ft.

In Mingo County Thomas W. Harvey, trustee, completed the Esther Chafin test in Kermit district at 2,879 ft., gaging 134,000 cu. ft. a day 1 hour after shot.

In Ritchie County S. R. S. Oil Co. completed a second test on the C. R. Bradley farm in Grant district in the Squaw sand at 1,642 ft., gaging 168,000 cu. ft.

In Roane County Reedy Oil & Gas Co. drilled on the C. W. Lewellen farm in Curtis district through the Shale sand topped at 1,699 ft. to 1,739 ft. There was a show of oil at 1,726-36 ft., but it will be abandoned.

In Wirt County S. W. Douglass drilled No. 67 Roberts, Pell, and Newman, in Spring Creek district, through the Injun sand to 1,830 ft. and it was dry.

Oriskany Gas Fields

No new wells were completed in the Oriskany gas

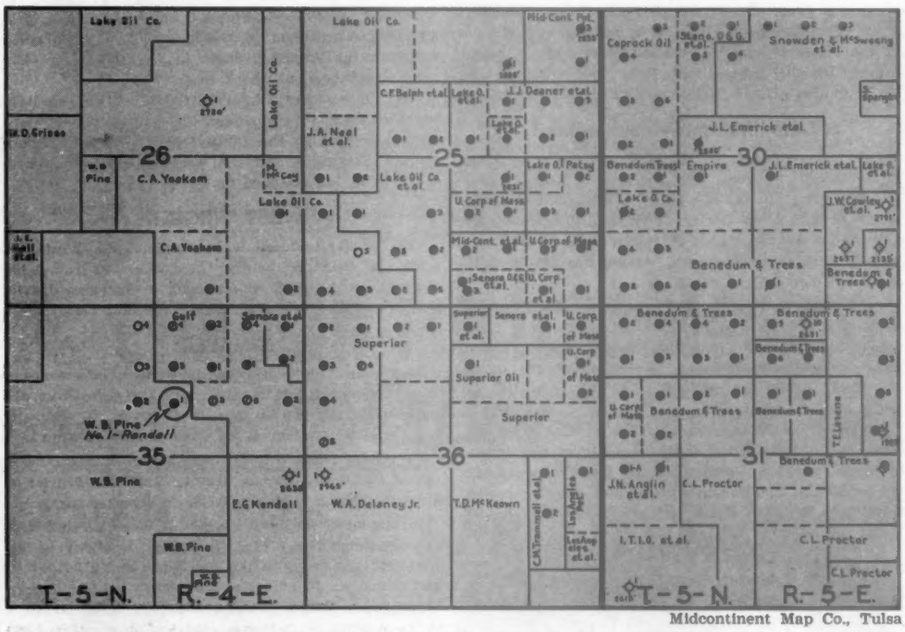
(Continued on Page 100)

Oklahoma Operations

By
DAL DALRYMPLE

Marshall Discovery Has Oil In Second Tulip Creek Sand

Discovery of oil in the first and second Tulip Creek sands at Pure Oil Co.'s No. 1 Quinton Little A, C W½ NE SE Section 28-5s-7, near Cumberland in Marshall County, has resulted in one of the larger lease plays in Oklahoma in recent years. No leases are open on the discovery structure, the Pure company holding an almost solid block of approximately 22,000 acres, but the trend is southeastward from eastern Marshall into western Bryan County. Unleased acreage between the Pure block and a block held by the Stanolind and Amerada companies around the town of Aylesworth was taken by the lease buyers. High prices are being paid for royalty under the Pure block and at considerable distance therefrom. The discovery well and much of the leased land is in an area that will be inundated if the Denison Dam project on the Red River is completed.



Midcontinent Map Co., Tulsa

Several tests in the southwest extension of the Bebee field, Pontotoc County, where W. B. Pine's No. 1 Randall, Section 35-5-4e, was completed for 480 bbl. of oil daily, were nearing decisions. Senora Oil Co.'s No. 3 Tucker, east offset to No. 1 Randall, flowed 30 bbl. an hour after a shot; the north offset, Gulf Oil Corp.'s No. 3 Watson, was pumping 250 to 260 bbl. daily, and the west offset, W. B. Pine's No. 2 Randall, was drilling around 2,000 ft.

The No. 1 Little topped second Tulip Creek sand at 5,088 ft. and was bottomed at 5,180 ft., believed near the base of the sand break. It was cored most of the way. Five efforts to make a drill-stem test failed. On the sixth attempt, with packer set at 4,995 ft., the well started showing gas and a little fluid and mud in a few minutes after opening the drill stem. After about 50 minutes, oil began flowing through ⅞-in. choke on drill pipe and a 2-in. line into pits, at the rate of about 60 bbl. an hour. The well was allowed to flow for 27 minutes before being shut in. Gas gaged about 3,500,000 cu. ft. daily. Gravity of the oil was 36.5° to 37°. Previously, on drill-stem test in the first Tulip Creek sand at 4,903-61 ft., it flowed 70 bbl. of oil in 14 minutes, but had less gas than in the second sand. The hole was being conditioned, preparatory to coring ahead.

Johnson-Kemnitz and others' No. 1 Neff-Godfrey, SW SE, NE Section 14-6s-6e, wildcat west of Aylesworth, Marshall County, was preparing to resume work. It has been shut down several weeks, reportedly in Bergen sand at 4,455 ft., where mud and water showed on drill-stem test. Operators were expected to set casing on bottom, perforate and test upper horizons. If production is not found it may be deepened to Arbuckle lime.

Olson Drilling Co. were moving in material preparatory to deepening Anderson-Prichard Oil Co. and others' No. 1 Geis, C NE SW Section 15-18-9w, gas discovery well northwest of Kingfisher in the county of that name. The crew was expected to start rigging up this week. Plans are to deepen the hole 1,000 ft. or to test second Wilcox sand. It was drilled to contract depth at 8,507 ft. last November, plugged back and casing was perforated at 7,333-48 ft., the well being completed for an estimated 2,000,000 cu. ft. of wet gas daily. Location is on a 7,000-acre block assembled by the Anderson-Prichard company. Other companies interested in the block or having adjacent acreage include the Magnolia Petroleum, Sinclair Prairie, Ohio, Pure, Gulf, Indian Territory, Sun, Deep Rock and Texas companies.

The sixth producer in the West Weleetka area, Okfuskee County, was near completion at total depth of 2,150 ft. in Booch sand. It was Paul McIntyre, Summit Drilling Co. and others' No. 4 Steil, SE NW SW Section 18-10-11. After casing was cemented and plug drilled, it flowed 1,695 bbl. of 41-gravity oil in 15 hours.

McClain County

Patsy Oil Co.'s No. 1 Richardson, SE SW SE Section 9-5-3, topped Viola at 3,502 ft., set 7-in. casing at 3,503 ft. and flowed 292 bbl. of oil in a 4-hour test. Total depth was 3,652 ft.

Simpson-Roodhouse's No. 1 James, SW SE SE Section 9-5-3, had Viola top at 3,500 ft., Trenton at 3,575 ft., total depth at 3,660 ft. and flowed 250 bbl. of oil in 12 hours, cutting 6 per cent.

Estimated Daily Production

Estimated daily production for Oklahoma for the week ended March 16, and for the preceding week was as follows:

	Barrels	
	Mar. 16	Mar. 9
Allen	5,850	5,800
Billings	6,450	6,225
Burbank	7,200	7,175
South Burbank	8,650	8,625
Blackwell district	3,775	3,750
Balance Osage	16,800	16,750
Bristow-Slick	6,300	6,275
Chandler	1,450	1,425
Crescent	2,350	2,300
Cromwell	2,900	2,875
Cushing-Shamrock	9,525	9,475
Duncan	3,725	3,700
Edmond	4,350	4,325
Fish	3,450	3,425
Fitts	18,200	19,800
Jesse	2,250	2,200
Graham-Fox	2,100	2,100
Gray	750	750
Healdton	8,750	8,800
Hewitt	3,675	2,850
Keokuk	3,200	3,150
Konawa	1,250	1,275
Lucien	8,350	8,325
Moore	2,025	2,050
Oklahoma City	93,950	103,250
Olympic	2,425	2,450
Ramsey	4,200	4,725
Sasakwa	1,700	1,725
Sholem-Alechem	2,825	2,850
Seminole district:		
Bowlegs	7,525	7,500
Carr City	2,450	2,425
Dora	2,325	2,350
Earlsboro	4,525	4,525
South Earlsboro	625	600
East Earlsboro	2,250	2,200
Little River	6,750	6,750
East Little River	675	700
Maud	750	725
Mission	1,275	1,225
Seminole	7,450	7,425
East Seminole	1,200	1,150
Searight	2,350	2,325
Total Seminole	40,150	39,900
St. Louis-Pearson	32,300	32,500
Tatums	1,850	1,850
Tonkawa-Garber-Thomas	4,075	4,050
Wewoka	1,600	1,600
Yale-Jennings	3,575	3,525
Other pools	94,400	95,000
Total Oklahoma	416,375	426,850

Pottawatomie County

Alma Oil Co.'s No. 5 Johnson, NE SW SW Section 19-6-5, had pay in sand at 2,825-44 ft. After a shot it flowed 207 bbl. of oil in 24 hours. Total depth was 2,885 ft.

Same company's No. 6 Johnson, NW SW SW Section 19-6-5, flowed 40 bbl. of oil in 24 hours from sand at 2,810-19 ft. Five-inch casing was set at 2,800 ft.; total depth 2,883 ft.

Three failures were reported in Pottawatomie County. Denver Producing Co.'s No. 1-A Houck, SE NW NW Section 1-6-4, an old well reworked, was bottomed in Arbuckle at 5,118 ft., plugged back to 4,368 ft. and temporarily abandoned. Former total depth was 4,440 ft.

Moday's No. 1 O'Conner, NW SE SE Section 25-6-4, had Hunton at 3,255 ft., total depth 3,380 ft. with no shows, and was dry and abandoned.

Alma Oil Co.'s No. 2 Johnson, NW SW Section 19-6-5, topped sand at 2,909 ft., sandy shale at 2,923 ft., and at total depth of 2,991 ft. had a showing of oil and 800 ft. of water and was abandoned.

Eason Oil Co.'s No. 1 Blackbird, NW SW Section 19-6-4, was building rig.

New Wildcat Operations

Whitehead's No. 1-A Allen, NE SW Section 11-4-19, Latimer County, was drilling at 200 ft.

In Hughes County Southern's No. 1 Bratten, SW NE Section 17-8-10, was rigging up.

In Okfuskee County Yoakum made a location for No. 1 Marshall, C SW SE Section 34-12-9.

Pontotoc County

W. B. Pine's No. 1 Randall, NW SW NE Section 35-5-4, had Viola at 2,300 ft.; set 5-in. casing at 2,310 ft.; dolomite at 2,440 ft.; total depth 2,515 ft., and after acidizing it swabbed 480 bbl. of 38.5-gravity oil in 24 hours.

Arrowwood's No. 1 McCool, SW NE NE Section 6-4-7, found dry sand from 1,530-70 ft.; total depth was 1,614 ft., and was abandoned.

Hall's No. 2 Sumners, SW SE Section 26-5-4, was spudding.

Okfuskee County

Summit Drilling Co.'s No. 2 Simmer, CEL SE NW Section 18-10-11, had Booch sand at 2,270 ft., set 5-in. casing at 2,267 ft. and flowed 175 bbl. of oil in 24 hours. Total depth was 2,275 ft.

Wells' No. 1 Powell, C NW SW Section 30-10-12, had Booch sand at 2,124-50 ft., total depth and gaged 3,000,000 cu. ft. of gas daily.

Miscellaneous Completions

Wilcox Oil Co.'s No. 12 School Lands, SE SW SW Section 16-14-6, Lincoln County, had Prue sand at 3,092 ft., total depth at 3,140 ft. It was shot and flowed 20 bbl. of oil in 24 hours.

Chapman's No. 2 McNac, SE NW SE Section 35-15-10, Creek County, found Viola lime at 3,100 ft., dolomite at 3,127 ft., Wilcox at 3,139 ft.; was bottomed at 3,165 ft., shot and pumped 107 bbl. of oil in 24 hours.

In Hughes County Manahan's No. 1-A Mullie, SW NE Section 23-6-8, topped Booch at 2,690 ft., Gilcrease at 3,090 ft., had total depth at 3,318 ft. and was dry and abandoned.

Seminole County

Deep Rock Oil Corp.'s No. 4 Douglas, SW NW SE Section 30-8-8, had Booch sand at 2,895-2,920 ft., total depth. After shooting the well flowed 191 bbl. of oil in 24 hours.

Clark's No. 1 Ferguson, NE SE SW Section 19-7-8, reached dolomite at 4,110 ft., Wilcox at 4,158-65 ft., total depth, was acidized and shot and flowed 75 bbl. of oil in 24 hours.

Villines' No. 1 Church, SW NW SE Section 36-7-5, had a showing of oil in sand at 3,004-90 ft., was bottomed at 3,100 ft. and after shooting received only a slight showing of gas and oil and was dry and abandoned.

New work in Seminole County: Malernee Oil Co.'s No. 4-A Wood, SW NE SE Section 33-7-6, was drilling at 120 ft. Culver's No. 2 Swan, SW SE SW Section 3-5-5, location.

Wildcat Operations

In Lincoln County Youngblood's No. 1 Wright, NE SE Section 32-16-6, swabbed 37 bbl. of oil in 8 hours at 3,788 ft. Top of Viola was 4,017 ft., second Wilcox 4,172-79 ft., total depth, where salt water was encountered and the well was plugged back to 3,955 ft., pumping 37 bbl. in 24 hours, initial potential.

In Pottawatomie County Alma Oil Co.'s No. 1 Lyday, SE NE SW Section 30-6-5, had Wilcox at 3,935 ft., total depth at 3,979 ft. and was dry and abandoned.

In McIntosh County Acme's No. 1 Stanford, NE SW Section 22-11-14, was a failure with a showing of gas and water in sand from 1,337-1,412 ft., total depth.

Fain Drilling Co.'s No. 1 Schnakenburg, NE SE SW Section 21-21-4w, Garfield County, topped dolomite at 6,455 ft., Wilcox from 6,515-42 ft., total depth, and was dry and abandoned.

Champlin Oil Co.'s No. 2 Thompson, NE SW NW Section 7-13-8, Okfuskee County, had a showing of oil in Skinner sand at 2,690-94 ft., was drilled to 2,996 ft., total depth, and was abandoned.

In Latimer County Whitehead's No. 1-A Allen, NE SW Section 11-4-19, had show of oil and gas at 576-615 ft. At 1,061 ft. the hole was lost and the well abandoned.

Miscellaneous New Work

Gulf Oil Corp.'s No. 8 Garrett, C NW SW Section 27-2s-3w, Carter County, was rigging up rotary to rework. Old total depth was 8,315 ft. Tomlinson's No. 1-A fee, NE SW SE Section 16-4s-3w, was drilling at 190 ft.

Indian Territory Illuminating Oil Co.'s No. 4 Graham, NW NE Section 1-3s-19w, in Tillman County, was preparing to drill deeper. Old total depth was 3,113 ft.

In Comanche County Daube's No. 1 Love, SE NE NE Section 32-1s-13w, was rigging up rotary.

Ohio Fields

(Continued from Page 80)

dy's No. 1 Mary Morgan, Section 15, was drilled deeper from the Keener sand to the Berea for 100,000 cu. ft. of gas, open flow; sand at 1,739-47 ft.

In the Newark field, Licking County, Newark Township, Lacknett and others' No. 2 Willis Bachelor, north part of first quarter, found the Clinton sand dry, total depth 2,565 ft. There were two Berea completions in Mary Ann Township, St. Albans Co.'s No. 5 Purley Wright, fourth quarter, made 10 bbl. of oil the first day, after a shot in sand at 744-53 ft.; William Stricker and others' No. 3 I. N. Porter, Lot 2, fourth quarter, was dry, total depth 630 ft.

In Lorain County, Penfield Township, Ohio Fuel Gas Co.'s No. 1 George Spitzer, Lot 44, Section 5, was dry through the Clinton, total depth 2,623 ft.

In Meigs County, Letart Township, Roy Proffitt and others' No. 1 W. H. Hayman, Section 5, had a small show of oil and gas in the second Cow Run, but was abandoned at 780 ft.

In Noble County, Beaver Township, Betts & Peterson's No. 2 John Gilmore, Section 3, is a small gas well in the Berea at 1,573-83 ft.

In Perry County, Madison Township, Gas Producing Co.'s No. 4 E. W. Skinner, Section 17, gaged 1,600,000 cu. ft. of gas, open flow, after drilling only 4 ft. in the Clinton sand, topped at 3,170 ft.

In Washington County, Ludlow Township, R. A. Marshall's No. 1 I. R. Rinard, Section 27, is a 10-bbl. pumper in the Injun sand at 1,307-09 ft.

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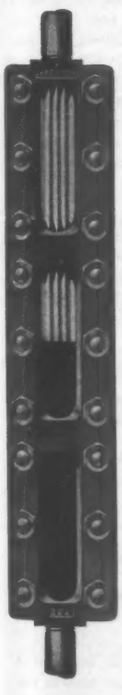

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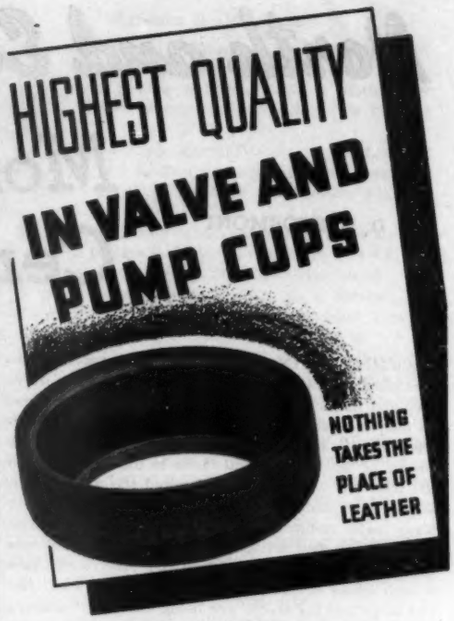

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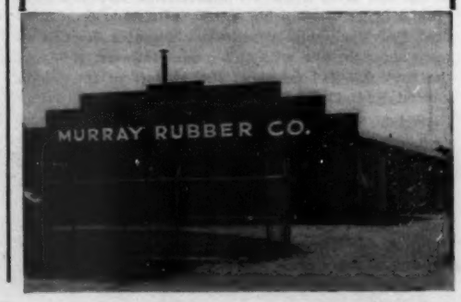

North and East Texas

By
D. H. STORMONT

Montague County Continues Center of Activity in Leasing

WICHITA FALLS, Tex., Mar. 18.—Montague County continued to draw the attention of independent operators and major companies alike during the past week as land men for practically every oil firm in the district literally scrambled for available acreage. The discovery of the two deep oil fields in the county within the past few weeks has inaugurated the most intense leasing and blocking campaign known to the county. Many major companies were reported to have as many as three land men active in the county buying acreage. Prices range from $10 to $100 per acre, some rank wildcat leases bringing as much as $15 per acre. Several large drilling blocks are being assembled preparatory to staking deep tests while others have already been completed.

The area surrounding the town of Ringgold in the extreme western part of Montague County had most of the leasing activity during the past week as the result of the 2-week-old discovery by W. B. Omohundro 3 miles to the south. Omohundro's No. 1 Seay, Section 32, Block 4, H.&T.C. Survey, was opened for several flows during the week but is yet ungaged. At last reports the discovery well was still cleaning out, with gage expected early this week. It is the third discovery in the county from the Caddo sandy conglomerate pay. No. 1 Seay found pay from 5,690 to 5,704 ft. and set casing at 5,689 ft.

Good Prices for Leases

Sinclair Prairie Oil Co., largest trader in the leasing spree, is reported to be paying $15 per acre for tracts 5 miles southeast of the Omohundro discovery well. Youngblood & Foree, Dallas, took 1,300 acres at $22.50 per acre while J. S. Bridwell, Wichita Falls, paid $10 per acre for 2,000 acres. Deep Oil Development Co., Wichita Falls, is reported to have paid $32,000 cash and contracted to pay $32,000 out of oil for the J. T. Prather 320 acres in the north half of Block 6, H. Deister Survey, 3½ miles south of the discovery well.

First actual location as a result of the discovery well was made by R. O. Harvey, Wichita Falls, on a block of 3,800 acres some 6 miles south of the field opener. The test will be No. 1 H. R. Roland, east half of Block 10, Jack County School Lands Survey. Contract depth is 6,000 ft.

Superior Oil Co. entered the county for the first time last week taking 340 acres 4 miles west of Saint Jo and 500 acres 7 miles south of the townsite for $7.50 per acre. Humble Oil & Refining Co., late in entering the play, was reported at the close of the week to have three land men checking available acreage. It has been estimated that some 23 operators are active in the play, including seven major companies.

Sinclair Prairie's Strike

The discovery well by Sinclair Prairie Oil Co. 2 weeks ago, just west and slightly south of the town of Bonita, was given its official gage early in the week and three new locations have already been made in the new area. It was completed for a Railroad Commission gage of 2,116 bbl. of oil daily from the Caddo lime. Previous potential estimates based on short flows were about in line with this gage. However, this was the first full 24-hour flow. Pay was from the Caddo lime at 5,241-49 ft.

Sinclair Prairie is preparing to drill below surface casing seat in its No. 1 David Doty, 840 ft. west of the discovery and in the J. H. Jones Survey. The company has located its No. 2 Howard, 427 ft. from the west line and 494 ft. from the south line of the W. B. Howard tract, a south offset to the field opener. Meanwhile, F. K. Williford and T. C. Rose were seeking approval of an application to drill a wildcat test in the Bonita townsite and on land owned by W. M. Goldsmith.

Cooke County

A 5,000-ft. rotary wildcat test has been projected for northeastern Cooke County by Tolbert & Turledge, of Tulsa and Dallas. The acreage was farmed out from Sinclair Prairie Oil Co. and lies about 4 miles north of Gainesville and a mile south of the Red River. It is some 6 miles southwest of the Walnut Bend field. The operators have staked No. 1 H. W. Stark, 330 ft. west of the northward continuation of the east line of the B.B.B.&C. Survey, Abstract 175, and 660 ft. south of the north line of the B.B.B.&C. Survey, Abstract 155.

Baylor County

Four miles southeast of the Green pool in eastern Baylor County Hall & Jordan have staked location for No. 1 F. C. Green, J. E. Hix Survey, Abstract 1376. It will be contracted to the Canyon lime producing in the field proper, and it is approximately ¼ mile southeast of British American Oil Producing Co.'s No. 1-L Green, a failure in the Canyon lime due to faulty water shutoff. The lease was farmed out from the British American company.

NORTH TEXAS COMPLETIONS

Archer County

Barnes & Traugh's No. 2 Ray Carson B, 4,330-47 ft., 1,900 bbl. L. T. Burns' No. 1 H. Munchart, 1,137 ft., dry. Cato Oil Co.'s No. 5 O. T. Anderson, 1,057-70 ft., 410 bbl. Chapman & McFarlin's No. 4 L. F. Wilsen D, 4,257-4,330 ft., 1,070 bbl. C. B. Christie's No. 1 H. H. Taylor, 5,281 ft., dry. Cities Service Co.'s No. 27 L. F. Wilson C, 4,357-67 ft., 720 bbl. Cox & Hamon's No. 3 O. T. Anderson, 4,383-4,438 ft., 240 bbl. Cox & Hamon's No. 1 Dr. J. A. Little "Big", 4,334-75 ft., 1,200 bbl. Deep Oil Development Co. and others' No. 5 Dr. J. A. Little, 4,300-18 ft., 3,000 bbl. Jim Fish's No. 1 A. B. Clagett, 1,216 ft., dry.

N. D. Goldsmith's No. 1 A. P. Neal, 1,105 ft., dry. W. B. Hamilton's No. 7 A. J. Ikard C, 1,167 ft., dry. Helmerich & Payne & Blackwell's No. 8 L. F. Wilson, 3,836-52 ft., 1,150 bbl.; No. 9 L. F. Wilson, 3,856-72 ft., 1,580 bbl.; No. 11 L. F. Wilson, 4,348-72 ft., 1,320 bbl. Bert L. Ligon's No. 8 O. T. Anderson, 4,406-17 ft., junked. Bert L. Ligon's No. 1 J. H. White D, 4,370-4,415 ft., 252 bbl.; No. 2 J. H. White D, 1,655-57 ft., 15 bbl.

Rancho Oil Co.'s No. 16 H. O. Prideaux, 601-58 ft., 10 bbl. J. C. Sharp's No. 1 W. N. Miller, 719-57 ft., 5 bbl. Snoddy & Peery's No. 1 S. E. and W. G. Webb, 915 ft., dry.

Baylor County

British American Oil Producing Co.'s No. 3 R. E. Fowlkes, 2,523-28 ft., 525 bbl.

Clay County

Bobby Burns' No. 1 E. H. Hamilton, 1,141-59 ft., 10 bbl; No. 3 E. H. Hamilton, 1,105-21 ft., 120 bbl.; No. 5 E. H. Hamilton, abandoned location. L. T. Burns' No. 3 A. L. and E. W. Browning, 4,517 ft., temporarily abandoned. L. T. Burns' No. 1 E. Henderson, abandoned location.

L. T. Burns' No. 1 J. G. Mullens, 3,655 ft., dry. No. 1 Tom Watson, abandoned location. E. N. Costley's No. 4 W. J. McInnes, 1,086-1,122 ft., 100 bbl.; No. 1 W. J. McInnes B, 1,065-82 ft., 280 bbl.; Nos. 5, 6, 7, 8, C. T. Taylor C, abandoned locations.; No. 7 C. T. Taylor D, abandoned location.

Gorman Drilling Co.'s No. 1 C. T. Taylor estate, 1,204 ft., dry. Gorman & Norwood's No. 1 Cheeves Turner Oil Co., 1,197 ft., dry; No. 1 C. T. Taylor estate, 1,315 ft., dry. W. B. Hamilton's No. 1 W. M. McGregor and others, 1,350 ft., dry. Harvey Drilling Co.'s No. 4 C. T. Taylor estate, 1,135 ft., dry; No. 5 C. T. Taylor estate, 1,074 ft., dry; No. 6 C. T. Taylor estate, abandoned location. Riner, Fain & Stilley's Nos. 3 and 4 E. H. Hamilton, abandoned location; No. 1 Joe Patrick, 1,130 ft., dry. Staley Oil Co.'s No. 1 John Barry, Jr., 850 ft., dry.

Cooke County

Charles A. Black's Nos. 1, 2, 3 Mary Luke, abandoned locations. Bridwell Oil Co.'s No. 3 Joe Fisher, 1,185 ft., dry. G. & L. Oil Co.'s No. 16 J. J. Perkins, 769-91 ft., 34 bbl. Sinclair Prairie Oil Co.'s No. 1 J. M. Best, 4,875-4,918 ft., 412 bbl.; No. 7 McGeorge, 4,878-4,920 ft., 785 bbl.; No. 8 P. McGeorge, 4,908-32 ft., 1,100 bbl. Dr. J. Q. Spradlin's Nos. 6, 7, 8, R. W. Trew, abandoned location.

Jack County

W. L. Forbes et al's No. 1 W. Davis, 2,518 ft., dry.

Montague County

Walter K. Jones' No. 1 E. E. Johnson, 4,920 ft., dry. Rogers & Rogers' No. 3 Charlotte W. Astley, 5,236-66 ft., 1,530 bbl.

Wichita County

Fain & McGaha's No. 14 E. P. Griffin B, 3,733-95 ft., 1,080 bbl. Hammon and others' No. 10 W. H. Hammon, 3,979-4,061 ft., 1,350 bbl. Hanlon-Buchanan, Inc.'s No. 8 Fassett & Tuttle E, 3,960-4,031 ft., 375 bbl. King Oil Co.'s No. 1 W. T. Waggoner R, 1,570-95 ft., 16 bbl. George Proctor's No. 49 Ed Foster A, 1,050 ft., dry. Ray Oil Co.'s No. 1 E. P. Griffin, 3,853 ft., dry. Southport Oil Co.'s No. 13 State Lands, 3,920-4,064 ft., 496 bbl. Sunray Oil Co.'s No. 5 L. C. Denny, 3,860-90 ft., 646 bbl. Tidewater Associated Oil Co., et al's No. 24 Charles Pettit, abandoned location; No. 25, abandoned location.

Wilbarger County

Consolidated Oil Co.'s No. 1 G. B. Ancell C, 3,943-87 ft., 720 bbl.; No. 1 W. T. Waggoner estate GG, abandoned location. Lawson et al's No. 3 W. T. Waggoner W, 1,264-85 ft., 187 bbl. 16 hours. Texas Co.'s No. 2 W. T. Waggoner C, 2,430 ft., dry.

Young County

Cosden Petroleum Corp.'s No. 1 W. E. Steele et al., 3,734-3,911 ft., 22,000,00 cu. ft. gas. Danciger Oil & Refining Co.'s No. 2 H. C. Shanafelt, 4,607 ft., dry. E. W. Robitaille's No. 3 J. C. Vaughan A, 3,934-4,059 ft., 511 bbl. E. D. Willis' No. 4 R. J. McCloud, 892-99 ft., 10 bbl.

EASTERN TEXAS

DALLAS, Tex., Mar. 18.—The starting of work on four wildcat tests, two to seek production from the Woodbine sand, one from the Paluxy and one from the Pettit, centered the attention in the eastern Texas district as the week closed.

Early in the week W. P. Vaughn, Dallas, announced location for a 4,500-ft. Paluxy sand wildcat test in the Tira community of Hopkins County. The test has been spudded and was last reported drilling below 160 ft. It is No. 1 Employers Reliance Co., on the Mary Chapman tract in the Francis Hopkins Survey, southeast of the Paluxy producing Sulfur Bluff field of Hopkins County.

Another attempt to find Woodbine production on the LaRue dome southeast of Athens in Henderson County will be made at a location staked by Dilworth Hager, Dallas. It is No. 1 Faulk & Coleman, R. S. Rayburn Survey, 2,000 ft. south and 200 ft. east of the northeast corner of the Z. Monk Survey. It is contracted to 4,600 ft. and is about 2,500 ft. north of a failure drilled by the operator some 2 years ago on the same

tract. Six holes have been drilled on the dome with no success in finding oil production.

Gregg County's proposed 8,000-ft. test in the Willow Springs deep gas area in the southeastern part of the county by Roger Lacy was last reported idle after spudding to 150 ft. The test is to be drilled on a deal to furnish gas to the city of Longview. It is No. 1 Lacy estate, S. P. Ford Survey, 3 miles southwest of Longview.

In northern Navarro County C. L. Brown's No. 1 Trammel, ½-mile-southeast outpost to the Bazette field, was preparing to spud after being shut down for several weeks due to bad roads. The test is in the P. Norton Survey and will seek the 3,000-ft. Woodbine sand.

Chapel Hill Area

A second oil producer for the Chapel Hill area of Smith County still remained uncertain at Sun Oil Co.'s No. 1 Huddle, outpost 2 miles south of the discovery distillate producer and 4 miles south of Shell Oil Co., Inc.'s discovery oil producer. No. 1 Huddle was preparing to drill in after casing was cemented at 8,225 ft. With several drill-stem tests having failed prior to cementing casing, the company was reported preparing to test both the Pettit lime and the Travis Peak as equal chances for production. Both levels showed oil while drilling but crew was unable to make satisfactory tests of either section. The company will perforate the 5½-in. casing for completion attempts.

Meanwhile Shell Oil Co., Inc.'s No. 1 Campbell, discovery oil well of the area, was given a second acid treatment during the week and a third official gage. First completed for about 250 bbl., naturally, the well was later acidized and completed for about 800 bbl. The second-stage acid treatment responded with a third initial potential of 1,025 bbl. daily, flowing. The Pettit lime formation from 8,036-68 ft. has now been given a total of 6,000 gal. of acid.

A half-mile southeast of the discovery oil well Sun Oil Co. is rigging up its No. 1 Everhart, the first of several tests which Sun expects to drill on the structure regardless of the outcome of the No. 1 Huddle.

Camp County

H. S. Moss' No. 1 Joe Venters, S. Wright Survey, prospective Pettit lime discovery well in Camp County, has been shut down with plug undrilled to await the clearing of titles to the operator's block. Five and one-half inch casing has been cemented on bottom at 8,068 ft., with possible producing sections as logged by electrical surveying device being from 7,947-78 ft., 8,003-09 ft., 8,015-35 ft. No flows have been made by the well.

EAST TEXAS FIELD COMPLETIONS

(One-hour gages)

Gregg County—Longview Area

Tom Potter's No. 1 M. Smith, 3,612-17 ft., 40 bbl. W. C. Turnbow's No. 2 D. McGrede, 3,593-3,614 ft., 115 bbl.

Gregg County—Kilgore Area

Overton Refining Co.'s No. 3-B, I.&G.N. Survey, 3,544-70 ft., 38 bbl.

Rusk County—Joiner Area

Cook Drilling Co.'s No. 6 Amanda Green, 3,758-80 ft., 40 bbl. Transo Oil Co.'s No. 9 W. P. Keeling, 3,678-90 ft., 40 bbl.

Smith County—Joiner Area

Gulf Oil Corp.'s No. 1 Trimble-fee, total depth 4,191 ft., to be used for a salt-water disposal well.

EAST CENTRAL TEXAS COMPLETIONS

Anderson County

In the Cayuga field J. R. Bunn's No. 2 Royall-Cone, T. Bristow Survey, 3,999-4,009 ft., 10 bbl. In the Long Lake field H. L. Hunt's No. 1 J. H. Reagan, E. Ewing Survey, 5,362-88 ft., 82 bbl.

Hill County

A wildcat, Carter-Bowland's No. 1 Atchison estate, dry and abandoned at a total depth of 85 ft.

California Fields

(Continued from Page 82)

Oil Corp. has staked location for another well in the Wheeler Ridge field at the extreme southern end of San Joaquin Valley. Location for No. 2 Kern County Land is in Section 28-11-20, not very far away from a deep hole which the company drilled last year. This is believed to be better located with respect to structure, and since the company's initial test produced a limited amount of crude and gas, this well may bear watching.

Coastal District

Tide Water Associated Oil Co. kept the Ventura Avenue field in the limelight as far as completions are concerned by finishing No. 21 Hartman, flowing 375 bbl. of 28.6-gravity oil cutting 10 per cent and 400,000 cu. ft. of net formation gas on a compressor from 9,860 ft. This well brought in flowing on compressor through a 128/64-in. bean showed a tubing pressure of 250 lb. and a casing pressure of 700 lb. No. 21 Hartman was finished with a 7-in. water string cemented at 9,105 ft. and 807 ft. of 5-in. liner landed at 9,855 ft. and carrying perforations at 9,116-9,855 ft. and 7,500 ft. of 3-in. tubing. Shell and Tide Water Associated Oil Co., which control practically all of the productive acreage in the Ventura Avenue field, have completed a number of exceptionally large wells during the past year indicating that the Ventura Avenue district is far from being developed to the maximum extent. Merchants Petrolum Co., which has completed a number of good shallow wells on its lease in the Sespe district of Ventura County, has decided to make No. 8 Cochran a deep Eocene test and the bit is going at 2,100 ft. in basal Sespe. No well in this immediate area has yet been carried to the Eocene and the outcome of No. 8 Cochran may prove of vital importance.

Illinois Fields

(Continued from Page 80)

tion 32, had McClosky pays at 1,996 to 2,057 ft. at intervals. The well pumped 196 bbl. a day. Texas Co.'s No. 5 E. Farthing B, SE SE SE Section 33-2n-2e, Benoist sand top at 1,897 ft., total depth 1,909 ft., pumped 182 bbl. a day without a shot.

In Clay County Pure Oil Co.'s No. 1 Kohlmeyer, SE SE NE Section 13-2n-7e, had Fredonia lime top at 3,015 ft., total depth 3,055 ft., acidized with 5,000 gal., pumped 154 bbl. Pure's No. 1 L. E. Stanford B, C S½ SE SE Section 13-2n-7e, Fredonia lime top at 2,993 ft., total depth 3,100 ft., acidized with 5,000 gal., pumped 256 bbl. of oil and 26 bbl. of water per day. Frost's No. 1 Crews, SE NW SW Section 27-1n-7e, Fredonia at 3,148 ft., total depth 3,162 ft., dry and abandoned after it had been acidized.

In Wayne County Robinson's No. 3 Caldwell, SE SE NW Section 34-2s-8e, McClosky pay at 3,395-3,401 ft., acidized with 2,000 gal., pumped 90 bbl.

In Wabash County Tide Water Associated Oil Co.'s No. 3 Spencer, NE NW NW Section 20-2s-13w, Cypress sand at 2,472-79 ft., swabbed and flowed 121 bbl. Superior Oil Co.'s No. 1 Hocking, SW NW SE Section 20-2s-13w, Cypress sand pay at 2,839-51 ft., pumped 64 bbl.

White County

In White County Superior Oil Co.'s No. 16 Ford, NE NE SW Section 4-5s-14w, had McClosky lime at 2,912-25 ft., flowed 120 bbl. per day through ¼-in. choke.

In the Storms pool Eason Oil Co.'s No. 2 Storms, SW SW SW Section 14-6s-9e, had Waltersburg sand at 2,225-60 ft., flowed 176 bbl. Eason Oil Co. and Ledbetter's No. 2 Rebstock, NW NE SE Section 14-6s-9e, Waltersburg at 2,263-78 ft., flowed 60 bbl. Eason Oil Co. and Angle's No. 6 Storms, SE NW SE Section 14-6s-9e, Waltersburg at 2,246-63 ft., flowed 124 bbl. Eason and Angle's No. 7 N. Storms, SW SE SE Section 14-6s-9e, Waltersburg at 2,225 ft., total depth 2,270 ft., flowed 92 bbl. of oil and 30,000,000 cu. ft. of gas. Eason and Angle's No. 8. N. Storms, SE SE SE Section 14-6s-9e, Waltersburg at 2,240-71 ft., flowed 200 bbl. Exchange Oil Co.'s No. 6 K. Storms, NW SW NE Section 14-6s-9e, Waltersburg at 2,245-70 ft., flowed 200 bbl. Exchange Oil Co.'s No. 3 N. Storms, SW NW NE Section 14-6s-9e, Waltersburb at 2,240-71 ft., flowed 200 bbl. Exchange Oil Co.'s No. 4 N. Storms, NE NW NE Section 14-6s-9e, Waltersburg sand at 2,250-78 ft., flowed 200 bbl. Exchange Oil Co.'s No. 3 Rudolph, NW NE NE Section 14-6s-9e, Waltersburg at 2,261 ft., total depth 2,284 ft., flowed an estimated 200 bbl. Exchange's No. 4 Rudolph, SE NE NE Section 14-6s-9e, Waltersburg at 2,254-79 ft., flowed 200 bbl. of oil and 4,000,000 cu. ft. of gas. Watkins and others' No. 1 Storms, NE cor. SE Section 22-6s-9e, Waltersburg sand at 2,192-2,214 ft. and 2,227-49 ft., 30,000,000-cu. ft. gasser, with no oil production.

Among the Outposts

In Iroquois County Whitlow's No. 1 Gannon, NE SW SE Section 5-27n-12w, was drilling at 141 ft.

In Tazewell County Bartelmay's No. 1 Mathis, SW NW SW Section 24-25n-3w, was below 300 ft. and drilling.

In Bureau County Kerchner's No. 1 Guither, NE cor. SE SW SE Section 2-18n-8e, of fourth principal meridian, was drilling at 350 ft. after setting 6-in. casing at 345 ft.

In Christian County Moore and others' No. 1 Meyers, SE SW SE Section 7-13n-1e, was shut down at 1,275 ft. The hole filled with water from Aux Vases sand.

In Coles County Carter Oil Co.'s No. 1 Seaman, NW NW SE Section 35-12n-7e, topped Devonian lime at 3,169 ft., and was at a total depth of 3,540 ft.

In Shelby County Seaboard Oil Co. and others' No. 1 Miller, SW SW SE Section 32-11n-2e, total depth 2,630 ft., with nothing showing; drilling ahead. Fredonia lime was topped at 1,723 ft.

In Clark County Allen & Sharritt's No. 1 Biggs, NE NE SW Section 9-11n-14w, topped Devonian lime at 1,245 ft. and was at a total depth of 1,715 ft., drilling. Harvey and others' No. 1-B Phillips, NW NE NE Section 18-11n-14w, was drilling at 550 ft.

In Crawford County LaSalle Drilling Co.'s No. 1 Berryhill, NE NE NW Section 9-6n-13w, had Devonian lime top at 2,789 ft. and Devonian pay at 2,794-2,816 ft. Casing was being run. Total depth is 2,976½ ft. with an odor of sulfur at the bottom. J. W. Cannon and others' No. 1 Zaner, SW SE SW Section 10-4n-11w, underreaming at 1,552 ft.

In Madison County Wilson's No. 1 Danderman, SW SW SW Section 1-5n-6w, was drilling at 625 ft. Jennings and others were drilling at 920 ft. in No. 1 Wagner, SE SW NW Section 22-4n-5w.

In Fayette County Texas Co.'s No. 1 Gray, NW SE NW Section 1-5n-2e, a location. Texas Co.'s No. 1 Pruitt, NW NW NE Section 1-5n-2e, drilling at 1,130 ft.

In Clay County Pure Oil Co.'s No. 1 Behymer, C E½ NE SE Section 33-2n-8e, acidized with 5,000 gal., total depth 3,126 ft., set 5½-in. casing at 3,013 ft. Pure's No. 1 Standford B, C S½ SE SE Section 13-2n-7e, Fredonia lime top at 2,993 ft., total depth 3,100 ft., pays at 3,002-12, 3,091-93 ft. and 3,095-98 ft. Set 5½-in. casing at 2,994 ft.

In Monroe County Morris and others' No. 1 Gummershimer, SW NW NW Section 31-1n-10w, had Trenton lime at 792 ft., drilling at 794 ft.

In Wabash County H. Riddle and others' No. 1 Seibert, NE cor. Section 4-1n-13w, flowed 410 bbl. of oil in 24 hours at a total depth of 2,743 ft., and was shut in for lack of storage.

In Wayne County Pure Oil Co.'s No. 1 Stella Billington, C E half SE NE Section 27-1n-7e, was drilling at 5,340 ft.; Al Stengle's No. 1 Withrow Consolidated, C S½ SW NE Section 34-1s-7e, drilling at 2,651 ft.

Southern Tests

In Edwards County Nash & Morrison's No. 1 Prudential Life, SE NE NE Section 24-2s-10e, total depth 3,240 ft., running casing.

In Gallatin County D. C. Colebeck's No. 1 Egyptian Tie & Lumber Co., SW NW NE Section 19-8s-10e, was drilling at 720 ft.

In Jackson County M. C. Trumbull's No. 1 Bennett, CSL SE¼ Section 35-8s-5w, had Trenton lime top at 2,755 ft., total depth 2,855 ft., and was preparing to run casing. W. R. Davis' No. 1 Michels, NE NW NW Section 18-9s-3w, shut down at 520 ft.

In Williamson County Joe Blalock and others were drilling at 1,000 ft. in No. 1 Hill, SW SW SE Section 4-9s-2e.

New Wildcat Operations

In Clark County Benson & Martin's No. 1 Briscoe, 1,020 ft. from south and 1,140 ft. from west lines of NE SW Section 29-11n-14w, was drilling at 300 ft.

In Crawford County La Salle Drilling Co.'s No. 2 Berryhill, a Devonian lime test in C E½ NE NW Section 9-6n-13w, a location.

In Lawrence County W. C. McBride, Inc., 665 ft. from west and 663 ft. from south lines SE Section 18-4n-10w, a location.

In Clinton County H. Hubbard's No. 1 DuComb, SW NW SE Section 23-3n-1w, drilling at 210 ft.

In Perry County Magnolia Petroleum Co.'s No. 1 Bruns, SE SE NW Section 5-4s-3w, a location.

In White County C. D. Neff and others' No. 1 Buss heirs, NE NE NE Section 28-5s-8e, location.

In Wayne County Pure Oil Co.'s No. 1 Obrecht Consolidated, C E½ NW NW Section 9-1n-8e, was drilling

at 2,213 ft. Nelson & Stromser's No. 1 Vaughn, NW cor. Section 1-3s-8e, rigging up rotary.

In Monroe County Dorsey Oil Co.'s No. 1 Rose, NW cor. SW Section 15-1s-10w, drilling at 720 ft.

In White County Phillips Petroleum Co.'s No. 1 Garr, C W½ NW NW Section 31-4s-11e, drilling at 4,173 ft.

In Perry County Magnolia Petroleum Co. was moving in standard tools for No. 1 H. Bruns, SE cor. NW Section 15-4s-3w.

In Williamson County Nation Oil Co.'s No. 1 Coleman, NW SW SW Section 1-10s-1e, topped Fredonia lime at 1,940 ft. and was at a total depth of 1,967 ft.

In White County Kingwood Oil Co.'s Devonian lime test, No. 1 Paul Martin, NW NW NE Section 13-7s-8e, ran a Schlumberger test at 3,045 ft., and was drilling at 3,085 ft. Fredonia lime was topped at 2,901 ft. Goodgame and others had started drilling No. 1 Shook, NE cor. NW NW Section 1-7s-8e.

In the new Irons pool in White County, Kingwood Oil Co.'s No. 1 Bailey, SE NE NW Section 25-6s-8e, was shot with 10 qt. at 2,509-19 ft., and swabbed 468 bbl. in 14 hours. It was not yet a completion.

In Crawford County Canadian Oil Co.'s No. 1 Goff, C E½ NW SE Section 16-5n-12w, Parker sand topped at 955 ft., drilling at 1,040 ft.

In Cass County Cass Community Oil Co.'s No. 1 Moslin, NW SE SE Section 2-17n-10w, was drilling at 950 ft. Salem lime (Lower Mississippian) was topped at 361 ft.

In Macon County S. D. Jarvis' No. 1 Veech, SE SE NE Section 11-16n-3e, was drilling at 1,586 ft.

In Shelby County Rex Development Co.'s No. 1 Odell, C E½ SE NW Section 20-14n-2e, was dry and abandoned at 1,979 ft. McClosky lime was topped at 1,421 ft. O. Baugher's No. 1 Anderson, NW cor. Section 36-12n-5e, was drilling at 1,015 ft.

In Clark County Snavely and others' No. 1 Schofield, SE NE SE Section 6-11n-11w, was drilling at 1,325 ft. H. R. Snavely's No. 1 Steve Freeman, NW SW NW Section 4-8n-11w, was drilling at 735 ft.

In Shelby County Turner's No. 1 Hoagland, NW NW SW Section 14-9n-4e, total depth 1,672 ft., was cleaning out after a successful fishing job.

In Bond County W. N. Lee and others' No. 1 Sharf, NE SW SE Section 27-7n-4w, total depth 2,016 ft., was plugged back to 605 ft. to test a sand at 561-98 ft. P. Harr's No. 1 Thacker, C E½ NE Section 29-7n-4w, drilling at 1,900 ft. Steele and others' No. 1 Black, SE NE SW Section 25-6n-2e, set 7-in. casing on top of Cypress sand at 1,592 ft., total depth 1,597 ft.

Eastern Fields

(Continued from Page 95)

field in Kanawha County. The final gage and depth of the W. S. Jones test in Poca district by Columbian Carbon Co. was 3,428,000 cu. ft., with the Oriskany sand at 5,282-5,357 ft. and total depth 5,381 ft. Godfrey L. Cabot, Inc., has locations for two wells on the John T. Bonham farm, with elevations of 623.7 and 693.2 ft. This operator is drilling No. 4 Putnam Co. at 1,795 ft.

United Fuel Gas Co. is down 4,839 ft. in No. 4863 Mary E. Carney and 2,027 ft. in No. 4864 W. J. Glass and others. United Carbon Co. is down 4,475 ft. in No. 816 Louisa E. Long, 725 ft. in No. 824 Resie Scott and others, and 1,380 ft. in No. 825 W. C. Woodall. Columbian Carbon Co. is drilling at 4,690 ft. in the Leonard C. Hanna test in Elk district and in Poca district 4,750 ft. in the Ida B. Mairs test, 1,390 ft. in the V. E. King test, 188 ft. in the Joseph Hughart test. West Virginia Gas Corp. is down 1,500 ft. in the Leon Jones test and W. O. Ziebold 1,020 ft. in the Hattie E. Clark test.

Outside Deep Tests

In Ripley district, Jackson County, Columbian Carbon Co. completed No. 2 Putnam Co. at 5,433 ft., with the Corniferous lime at 5,213-5,320 ft.; Oriskany, 5,320-5,403 ft.; gas, 5,324-27 ft., 5,337-42 ft., 5,356-62 ft., and a gage of 1,220,000 cu. ft. which increased after shot to 7,117,000 cu. ft. Godfrey L. Cabot, Inc., is drilling at 5,160 ft. in No. 3 Putnam Co.

In Washington district, Jackson County, two locations were made. R. E. McCabe will drill on the F. M. Ray farm, elevation 731 ft., and a location at elevation 1,028 ft. United Fuel Gas Co. has a location for No. 4879 Job E. Ray.

New Work

Clay County: South Penn Natural Gas Co.'s No. 115 O. D. Stockley, Henry district, elevation 823.33 ft.; Virginian Gasoline & Oil Corp.'s No. 140 Brown, Swann & Goshorn, elevation 950 ft.; Pittsburgh & West Virginia Gas Co.'s No. 7736 J. F. Wilson, Otter district, elevation 774 ft.

Gilmer County: Pittsburgh & West Virginia Gas Co.'s No. 7736 J. F. Wilson, Otter district, elevation 774 ft.

Gilmer County: Pittsburgh & West Virginia Gas Co.'s No. 7720 J. E. Hays, Glenville district, elevation 1,767 ft., and Lloyd Rinehart's No. 7747, elevation 872 ft.

Lincoln County: United Fuel Gas Co.'s No. 4428 Edna Stower, Union district, to be deepened.

Mingo County: United Fuel Gas Co.'s No. 1 Central Trust Co., Warfield district, elevation 1,250 ft.

Putnam County: Summit Gas Co.'s No. 1 J. S. Burdette, Curry district, elevation 654.2 ft.

La.-Ark. Fields

(Continued from Page 78)

Zwolle—Sabine Parish

P. C. Alexander's No. 1 Tilly, 330 ft. SW cor. NE SE Section 30-8-12, pumping 218 bbl., total depth 2,560 ft.

Wildcat—Sabine Parish

Claude H. Smith's No. 1 Whitney Corp., 330 ft. north and east of C Section 24-10-14, total depth 3,300 ft., ran electrical log, dry and abandoned.

Monroe—Union Parish

Memphis Natural Gas Co.'s No. 5 Lankford, Section 3-21-3, 1,500,000 cu. ft. gas, rock pressure 925 lb., total depth 2,198 ft. Memphis Natural Gas Co.'s No. 1 Wilson, Section 2-21-3, 3,500,000 cu. ft. gas, rock pressure 960 lb., total depth 2,200 ft.

ARKANSAS COMPLETIONS

Atlanta—Columbia County

J. K. Mahoney's No. 2 Emma Riley, C NE NE Section 14-18-19, 284 bbl., 6 per cent wash water, 12/64-in. choke, tubing pressure 1,675 lb., casing pressure 1,750 lb., total depth 8,220 ft.

Magnolia—Columbia County

Standard Oil Co. of Louisiana's No. 1 A. W. Gunnels, C SW NW Section 20-17-19, 744 bbl., ¼-in. choke, casing pressure 1,250 lb., tubing pressure 1,025 lb., total depth 7,589 ft.

Wildcat—Howard County

William James' No. 1 I. M. Rooke, Section 2-8s-27w, total depth 550 ft., dry and abandoned.

Champagnolle—Union County

Ouachita Union Oil Corp.'s No. 1 Ramsey estate, C NE SE NW Section 26-17-14, total depth 4,643 ft., dry and abandoned.

Gulf Coast Fields

(Continued from Page 89)

troleum Co.'s No. 41-A West, perforated casing 5,786-89 ft., 150 bbl., ¼-in. choke. Magnolia Petroleum Co.'s No. 51-A West, perforated casing 5,118-26 ft., 521 bbl., ¼-in. choke.

Liberty County

Hull field: Republic Production Co.'s No. 167 fee, sand 2,145-73 ft., 75 bbl., pumping.

Oklahomans to Testify on Bulk Products Rates

OKLAHOMA CITY, Okla.—C. B. Bee, rate expert of the Oklahoma Corporation Commission, concluded a 3-day hearing on rates and rules governing movement of bulk refined petroleum products within Oklahoma. The investigation, conducted in conjunction with an Interstate Commerce Commission case, obtained testimony which will be laid before a hearing of the I.C.C. at Denver, Colo.

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Michigan Field Report

Drilling Play Will Follow the Discovery in Ottawa County

By
OTTO C. PRESSPRICH

SAGINAW, Mich., Mar. 18. — Exploratory drilling continued widespread in Michigan last week with attention newly focused on Ottawa County's Holland Township, 5n-15w, where Crown Development Co. has made the latest discovery.

A comparatively heavy drilling play is expected as a result, evidence being the granting of three state drilling permits for new tests in Section 34, location of the No. 1 Reimold discovery, now on pump and said to be producing 200 bbl. a day, naturally.

Two of the permits were issued to Crown Development Co., one for No. 1 Teuntje Bloemers, SE NE NW Section 34, the other for No. 2 Reimold, NE SW NE Section 34. Twin Drilling Co. also entered the scene, obtaining a permit to drill No. 1 Albert Hyma, NE NW NW Section 34.

New production was at the year's low last week as completions totaling 26 included but 10 commercial wells, compared to 14 dry holes and 1 location abandoned. In addition a small natural-gas producer was completed in the new Hamilton Township discovery area in Clare County.

Low Average Initial Production

The 10 producers had total initial potential of slightly more than 1,400 bbl. a day, the best well being a Central Michigan test—Cities Service Oil Co.'s No. 1 Allen in the Isabella County, Wise Township, pool. The well, after treatment with 1,000 gal. of acid, was rated good for 411 bbl. a day. However, it was pinched in after 2 hours. Other producers were completed in Allegan, Clare, Kent, Monroe, and Ottawa counties, but none was outstanding.

Four of the failures were in Allegan's Overisel field. Traverse limestone tests, they were in Sections 33, 34, and 35, the field's only new producer being Jacob Bolema's No. 1 Vander Poppen estate, producing 96 bbl. a day, after being acid-treated. Lang & Lewis' No. 1 Fieser, Allegan's Salem Township, was good for 100 bbl., and Salem Gas & Oil Co.'s No. 2 Brenner did 90 bbl., but another test in Section 4 was abandoned, as was the Chief Oil & Gas Co. exploratory test in Section 36 of Allegan's Wayland Township.

Other southwestern Michigan failures included Kirkham's No. 1 Vosburgh, wildcat in Barry County's Johnstown Township, Dry Keeler's No. 1 Hosner, in Kalamazoo's Cooper Township, and several others in Kent and Ottawa counties. Kent County recorded three producers, the best being Certain-Teed Products Corp.'s No. 12 fee, rated at 200 bbl., and two dry holes. Fisher-McCall Oil & Gas, Inc., got a 240-bbl. producer in Ottawa's Tallmadge Township, while Red-Man Oil Co. abandoned a test; and in bordering Wright Township Dapar Oil Co. and C. E. Weller's No. 1 Powers wildcat also failed, as did Collins' No. 1 Morehead wildcat in Van Buren's Arlington Township.

In Clare County Pure Oil Co.'s No. 2 Kubat, Section 27, of Redding Township, produced 41 bbl. a day, naturally, and in the Hamilton gas area Sun Oil Co. completed No. 1 Switzer for 206,000 cu. ft. a day.

The Dundee pool in Monroe County produced a 50-bbl. well while exploratory tests in Dover Township of Lake County and in Logan Township of Mason County were abandoned. There was considered drilling activity under way throughout Central and Northeastern Michigan with several tests within a few days of completion stages.

Last week a total of 19 drilling permits was issued by the state Conservation Department. In addition to the three for Holland Township there were four for Allegan tests, one for Isabella, six for Kent, one each in Tuscola, Missaukee, and Muskegon counties, and two others in Ottawa.

Following is the completion summary for the week:

Allegan County

Overisel Township (4n-14w)—Four of the five Overisel completions were abandoned as dry holes, the sole new producer being Jacob Bolema's No. 1 Vander Poppen estate, NW NE NE Section 34, which, after being acid-treated, produced initially at the rate of 96 bbl. a day from 1,571 ft. Dry and abandoned at 1,534 ft. was W. Spencer Cook's No. 1-A Edward Schapp, NE SE SE Section 34. Fletcher & Leman's No. 1 Edward Schapp, NE SW SW Section 34, was dry and abandoned at 1,489 ft., and Red-Man Oil Co. abandoned No. 1 Herman Brower, SW SE SE Section 34, as a dry hole at 1,530 ft. Sprenger Brothers' No. 1 C. B. Van Buren, SE SE SW Section 35, was abandoned at 1,618 ft.

Salem Township (4n-13w)—Vic R. Wilson and Robert W. Atha's No. 1 Fred C. Bachman, SW SW SW Section 4, was abandoned as a dry hole at 1,830 ft. Salem Gas & Oil Co.'s No. 2 Fred W. Brenner, NW SE SW Section 14, completed at 1,598 ft., had initial daily production of 90 bbl. after being acid-treated. Production, after acid treatment, was 100 bbl. a day, initially, from Lang & Lewis, Inc.'s No. 1 Adam Fieser, SW NE SW Section 15, the well's depth being 1,604 ft.

Wayland Township (3n-11w)—Chief Oil & Gas Co.'s No. 1 Federal Land Bank, NE NE NW Section 36, was dry and abandoned at 1,844 ft.

Barry County

Johnstown Township (1n-8w)—The test dry at 1,995 ft., Dr. Virgil R. D. Kirkham abandoned No. 1 D. P. Vosburgh, NW NW SW Section 20.

Clare County

Hamilton Township (19n-3w)—Sun Oil Co. completed No. 1 G. J. Switzer, C N½ NW NE Section 26, as a small natural-gas well producing 206,000 cu. ft. a day from 1,269 ft.

Redding Township (19n-6w) — Pure Oil Co.'s No. 2 William Kubat, NW NW SE Section 27, was rated initially at 41 bbl. a day, naturally, total depth of the well being 3,885½ ft.

Isabella County

Wise Township (16n-3w) — Cities Service Oil Co.'s No. 1 Allen, SE SE NE Section 17, was completed at 3,705 ft., and after being acid-treated was producing 411 bbl. a day.

Kalamazoo County

Cooper Township (1s-11w)—M. Bliss Keeler's No. 1 Ellis Hosner, C NE SW Section 13, was dry and abandoned at 1,636 ft.

Lake County

Dover (20n-11w)—R. B. Tamblyn Development Co.'s No. 1 W. L. Kellog, NW NW NW Section 14, abandoned location.

Kent County

Walker Township (7n-12w) — American Drilling Co. abandoned No. 1 S. and J. Shellard, C S½ NW SE, at 442 ft. Smith Petroleum Co. and others' No. 1 George Van Poortvliet, C N½ NE SE Section 28, was good for 100 bbl. a day, naturally, at 1,904 ft., and Ide & Glavin Development Corp.'s No. 5 Riverside Sand & Gravel Co., SW SE SW Section 33, completed at 1,764 ft., produced 85 bbl. a day after treatment with acid.

Walker Township (6n-12w) — Certain-Teed Products Corp.'s No. 12 fee, SW NW NW Section 3, was good for 200 bbl. a day. The production was made after acid treatment, total depth being 1,775 ft.

Wyoming Township (6n-12w) — C. A. Welsh abandoned No. 1 L. T. Peck, NE SW SE Section 12, as a dry hole at 1,905 ft.

Mason County

Logan Township (17n-15w)—C. D. Dean's No. 1 W. O. Hinckley and others, C N½ NE NE Section 22, was dry and abandoned at 3,360 ft.

Monroe County

Dundee Township (6s-6e)—Bridger Basin Oil Corp.'s No. 2 Dusseau & La Pointe, SE SE NW Section 19, completed at 2,190 ft., produced 50 bbl. a day after acid treatment.

Ottawa County

Georgetown Township (6n-13w)—Red-Man Oil Co.'s No. 1 Guy Edson, SE NW NW Section 28, was dry and abandoned at 1,760 ft.

Tallmadge Township (7n-13w)—Fisher-McCall Oil & Gas Co., Inc.'s No. 3 Goodale, SW SE SE Section 24, completed and acid-treated at a depth of 1,857 ft., had initial production at the rate of 240 bbl. a day.

Wright Township (8n-13w)—Dapar Oil & Gas Co. and C. E. Weller's No. 1 John Powers, SW NE NW Section 28, was to be abandoned as a dry hole at 1,964 ft.

Van Buren County

Arlington Township (2s-15w)—E. W. Collins' No. 1 O. G. Morehead, NW NW SE Section 11, failed to rate commercially and was abandoned as a dry hole at 1,126 ft.

West Texas Fields

(Continued from Page 87)

Snyder field: Sinclair Prairie Oil Co.'s No. 7 Texas Land & Mortgage Co., 2,530-2,848 ft., 183 bbl.

Irion County

A wildcat, W. S. Kelly's No. 1 Yates, abandoned at 350 ft.

Loving County

Mason pool: Michigan Oil & Gas Co.'s No. 6 Kyle, 3,961-91 ft., 74 bbl., old well drilled deeper.

Pecos County

Superior Oil Co.'s No. 9 Iowa Realty Trust, 1,604-39 ft., 158 bbl.

Upton County

McCamey field: Cardinal Oil Co.'s No. 21 Wooley, 2,132-40 ft., 158 bbl. Parker Drilling Co.'s No. 3 King-Texas Co., 2,122-46 ft., 183 bbl. A. J. Rife's No. 9 Baker-Republic, 2,190-2,243 ft., 250 bbl. Rutter & Wilbank's No. 5 Elder, 2,115-2,251 ft., 291 bbl. Texas Pacific Coal & Oil Co.'s No. 2 Reese, 2,633-38 ft., 60 bbl., old well drilled deeper. Texas Pacific Coal & Oil Co.'s No. 5 Reese, 2,658-60 ft., 215 bbl., old well drilled deeper.

Ward County

Sealy field: Mid-Continent Oil Co.'s No. 5 Sealy, 2,991-95 ft., 1,186 bbl.

Yoakum County

Wasson field: Aloco Oil Co.'s No. 2 Hill, 4,960-5,216 ft., 756 bbl. Anderson-Prichard Oil Corp.'s No. 3-805 Spearman-Willard, 4,850-5,150 ft., 1,598 bbl. Argo Oil Corp.'s No. 6-A Comer, 5,005-5,213 ft., 1,200 bbl. Basin States' No. 2 Jordan, 4,980-5,204 ft., 210 bbl. Don Danvers' No. 1 Walter Anderson, 5,070-5,238 ft., 408 bbl. Honolulu Oil Corp.'s No. 2-890 Kendrick, 4,940-5,105

ft., 1,677 bbl. Mabee Oil Co.'s No. 24 Willard, 4,885-5,185 ft., 1,363 bbl. Magnolia Petroleum Co.'s No. 9 Mahoney, 5,110-80 ft., 1,415 bbl. Shell Oil Co., Inc.'s No. 7-B Baumgart, 4,800-5,193 ft., 1,267 bbl. Shell Oil Co., Inc.'s No. 6-D Baumgart, 4,880-5,110 ft., 1,203 bbl. Shell Oil Co., Inc.'s No. 2-B Brand, 4,939-5,076 ft., 1,031 bbl. Shell Oil Co., Inc.'s No. 1 R. M. Kendrick, 4,905-5,128 ft., 1,108 bbl.

Winkler County

Gulf Oil Corp.'s No. 74 Daugherty, 2,930-3,048 ft., 97 bbl. Stanolind Oil & Gas Co.'s No. 5 E. W. Cowden, 2,990-3,050 ft., 3,736,000 cu. ft. of gas.

WEST CENTRAL TEXAS COMPLETIONS

(24-hour gages)

Brown County

A wildcat, H. P. Evans' No. 1 Evans, J. Woodward Survey, dry and abandoned at 700 ft.

Cross Cut field: McCullum & Forber's No. 2 Williams, water sand from 611-620 ft., to be used for water well on ranch.

Callahan County

Putnam field: C. D. Roberts' No. 1-A Grandy, 603-614 ft., 1,500,000 cu. ft. of gas. B. and F. Cotton's No. 1 Ogle, dry and abandoned at 418 ft. Valley Osage and H. T. B. Production Co.'s No. 2 Slaughter, dry and abandoned at 400 ft.

A wildcat, Hunter & Graham's No. 1 Leggett, Section 7, Block 8, S.P. Survey, dry and abandoned at 1,385 ft.

Jackson field: Reeves' No. 1 Alexander, dry and abandoned at 1,319 ft.

Coleman County

Taylor-Link field: E. E. Thate's No. 1 fee, dry and abandoned at 862 ft.

Comanche County

Amity field: St. John & Choate's No. 2 West, 580-589 ft., 5 bbl. L. H. Choate's No. 1 Anderson, dry and abandoned at 659 ft.

Sipe Springs field: Day-Crowley's No. 1 Walker, dry and abandoned at 625 ft.

Coryell County

A wildcat, T. F. Wallace's No. 1 Murray, H. Farley Survey, dry and abandoned at 612 ft.

Eastland County

Eastland field: Hickok Production & Development Co.'s No. 1 Amis, top Mississippian 3,805 ft., top Ellenburger 3,812 ft., old well drilled deeper to 3,865 ft. and plugged back to 3,641-49 ft. for original completion of 50,000 cu. ft. of gas. W. A. Stiles' No. 1 Duncan, abandoned location.

Fisher County

A wildcat, Montour Production Co.'s No. 1 Taggart, Section 184, Block 2, H.&T.C. Survey, dry and abandoned at 5,664 ft.

Jones County

Lewis field: Fain-McGaha Oil Corp.'s No. 8 Shaheen, 1,866-83 ft., 295 bbl.

Noodle Creek field: Humble Oil & Refining Co.'s No. 2 I. Irwin, dry and abandoned at 315 ft. Robert & Cosden's No. 6 Grayson, dry and abandoned at 4,560 ft. Petroleum Producing Co.'s No. 3 McKeown, 1,877-82 ft., 269 bbl.

Huskey field: R. Sharrock's No. 4 Blanton, 506-521 ft., 5 bbl.

Albany field: J. L. Hart's No. 5 Lee, dry and abandoned at 449 ft.

Cook field: Roeser-Pendleton, Inc.'s No. 4-A-113 Cook, 1,553-62 ft., 1,892,000 cu. ft. of gas.

Taylor County

View field: Tal Vez Oil Co.'s No. 1 Richards, 2,367-92 ft., 310 bbl.

PANHANDLE DISTRICT

AMARILLO, Tex., Mar. 18.—The flurry of excitement caused by a wildcat test being drilled in the city limits of Amarillo, together with the staking of the greatest number of new locations in the large field's history, centered attention in the Panhandle district as the week closed.

Oil production within the city limits of Amarillo was indicated by Canadian River Gas Co.'s No. 1 Old Tack, projected 5,000-ft. exploratory test. The wildcat encountered some live oil in drilling at 3,862 ft.; however, it is being carried ahead toward contract depth. Large shows of gas were found at 3,778 ft. and at 3,789 ft.

Since the 20-acre spacing rule for the large Panhandle field has been temporarily rescinded, new locations have been steadily mounting. The large field, previously on a 10-acre spacing pattern, received notice that 20-acre spacing would become effective in the area March 12. Shortly after the order took effect the past week it was canceled; however, since 20-acre spacing still seems inevitable for the area, operators are attempting to stake all locations possible before the order takes final effect. A total of 72 intentions to drill were filed with the Railroad Commission office in Pampa the past week, Texas Co. taking the lead with 40, all in Hutchinson County. Shell Oil Co., Inc., staked 23 new locations to bring the weekly total to 51 for Hutchinson County, 14 for Carson County, and 7 for Gray County.

PANHANDLE COMPLETIONS

Carson County

Texas Co.'s No. 19 Boney, 3,005-3,110 ft., 780 bbl.

Gray County

Humble Oil & Refining Co.'s No. 11 Haggard, 3,196-3,245 ft., 238 bbl.

Hutchinson County

Midstates Oil Co.'s No. 31-A Whittenburg, 2,995-3,087 ft., 482 bbl. J. E. Crosbie's No. 29 Pitts, 3,005-75 ft., 581 bbl.

Australia Discussing Ban On Imports of Gasoline

THERE has been considerable discussion in the Australian Commonwealth recently of prohibiting imports of premium gasoline. The discussions have centered around the saving possible in foreign exchange and in the tanker tonnage required to transport the super fuels there. In the table which follows, showing imports of petroleum and shale spirit, gasoline (known in Australia as "petrol") is the only item of any consequence:

AUSTRALIAN IMPORTS OF PETROLEUM AND SHALE SPIRIT, INCLUDING BENZINE, BENZOLINE, GASOLINE, PENTANE PETROL, AND NAPHTHA, N.E.I.

Origin—	Fiscal year ended June 30, 1939: Imperial gallons	Value in £ sterling
Netherland East Indies	217,860,514	3,431,054
United States	49,994,577	728,888
Iran (Persia)	33,949,335	472,952
Bahrein Island	41,857,362	548,898
British Borneo	1,519,863	27,287
Other countries	2,605	571
Total	345,184,258	5,209,650

Note: 35 imperial gallons = 1 U. S. barrel of 42 gal.

Petroleum refineries are operated in Australia by two companies, Commonwealth Oil Refineries, Ltd., which is jointly owned by the Government of Australia and the Anglo-Iranian Oil Co., and Shell Co. of Australia, Ltd.

Since the outbreak of war there has been a reexamination of possibilities to increase the production of liquid fuel in Australia. In the case of benzol it appears the present production of around 5,000,000 imperial gallons annually is about as much as can be attained. It is admitted the gas companies could increase their output of benzol by 2,000,000 or 3,000,000 imperial gallons annually, but only at the expense of the quality of the gas which they produce.

The distillery in Queensland, which had been producing about 700,000 imperial gallons of power alcohol annually, is understood to have increased its rate of production to 1,200,000 imperial gallons annually. It appears that an increased output could not be attained until additional plant facilities are imported or manufactured in Australia.

The Colonial Sugar Refining Co. has a distillery at Sydney which is understood to be capable of producing at least 2,000,000 gal. of power alcohol annually from molasses. It is understood that the facilities of the Colonial company are now fully employed on the production of methylated spirits used by industry in Australia, and that the manufacture of power alcohol could be undertaken only by reducing the output of methylated spirits. It appears questionable that the Colonial company will undertake the production of power alcohol so long as the supply of imported gasoline is as satisfactory as it is today.

The present agreement between the Commonwealth Government and the producing company at Glen Davis (National Oil Pty., Ltd.) provides that petrol or other shale spirit produced by the company, to an amount not exceeding 10,000,000 imperial gallons per annum, shall be subject to a reduction of 5½ pence (11 cents) per imperial gallon in the excise duty on gasoline produced in Australia. Any quantity exceeding 10,000,000 imperial gallons annually would be subject to the full excise duty, namely, 6½ pence (13 cents) per imperial gallon. (Glen Davis is near the oil shale deposits of Newnes, and the development of Glen Davis is frequently referred to as the development at Newnes. Glen Davis is a new town where National Oil Pty., Ltd., is establishing its plant.

It is understood that, so far, there has been no interruption of supplies of gasoline reaching Australia, and executives of oil companies are understood to believe no difficulty is foreseen at this time in maintaining supplies. However, the acting minister for supply was quoted as saying, when he declared that the importation of "super" grades would be prohibited soon, that the object was to conserve foreign exchange (as contrasted with sterling exchange); and it is believed that any steps to ration gasoline in Australia would have that as the object, as well. Owing to the depreciation of the Australian pound in terms of dollars and other nonsterling currencies, and to increased transportation charges, the cost in Australian currency of imported gasoline has risen steeply since the outbreak of war. It is estimated that the elimination of "super" grades would save £500,000 ($2,500,000) a year, and that no great difficulty would be encountered in substituting ordinary grades for the "super" grades.

Forest City Basin

(Continued from Page 94)

Mo., were moving in equipment at Carl Lebsack's No. 1 Maduska, C SE NE Section 36-8s-20e, preparatory to spudding.

Phillips Petroleum Co. was drilling below 2,605 ft. at its No. 1 Creston, C SE NE Section 31-71n-30w, wildcat in Union County, Iowa. After setting 8-in. pipe to shut off water at 2,368 ft., it had 2,000 ft. of water in the hole at 2,450 ft. Outlook is dark. The company has dropped 116 more leases in the county.

Pawnee Royalty Co. had removed derrick at its No. 1 Meyers, Section 24-1n-15e, west of Falls City, Richardson County, Nebraska, recently abandoned after drilling to the granite. Rig is to be moved back to the Falls City discovery well, same company's No. 1 Boice, Section 18-1n-16e, as soon as roads dry. Operators are expected to deepen the discovery well, a Hunton lime producer, to Viola lime.

Summary of Operations, All Fields, February

SUMMARY OF ALL FIELDS

Wells Completed

	Comp.	Prod.	Dry	Gas
Eastern fields	483	751	15	67
Ohio	57	340	13	24
Michigan	97	16,930	25	4
Indiana	19	724	8	3
Eastern Kentucky	8	60	1	5
Western Kentucky	21	600	9	0
Illinois	298	334,028	39	3
Missouri	5	0	5	0
Kansas	104	24,658	14	4
Oklahoma	130	19,082	46	8
North Central Tex.	214	60,360	70	4
West Texas	150	131,595	10	0
Texas Panhandle	49	13,972	4	4
East Texas	23	1,560	0	0
East Central Texas	13	741	2	6
East Texas Border	5	20	3	0
Southwest Texas	183	14,003	62	4
Gulf Coast Texas	91	19,550	21	1
Gulf Coast La.	64	18,354	12	0
Mississippi	8	4,070	2	0
Arkansas	12	3,920	3	0
North Louisiana	34	1,850	5	7
Montana	9	939	2	0
Wyoming	10	6,594	1	1
New Mexico	60	19,716	7	2
Total February	2,147	694,417	379	147
Total January	2,173	502,680	485	180
Difference	26	191,737	106	33

Rigs and Wells Drilling

	Rigs	Dig.	Ttl.
Eastern fields	137	500	637
Lima	1	3	4
Ohio	44	117	161
Michigan	39	167	206
Indiana	5	65	70
Eastern Kentucky	6	32	38
Western Kentucky	2	57	59
Illinois	70	400	470
Missouri	0	3	3
Iowa	0	1	1
Nebraska	0	12	12
Kansas	32	104	136
Oklahoma	51	275	326
North Central Texas	229	296	525
West Texas	67	285	352
Texas Panhandle	36	103	139
East Texas	13	22	35
East Central Texas	5	39	44
East Texas Border	1	10	11
Southwest Texas	46	199	245
Gulf Coast Texas	24	109	133
Gulf Coast Louisiana	17	143	160
Mississippi	3	26	29
Arkansas	4	38	42
North Louisiana	10	51	61
Alabama	1	3	4
Florida	0	6	6
Georgia	0	3	3
Arizona	0	7	7
Montana	3	33	36
Wyoming	7	59	66
Colorado	1	25	26
New Mexico	22	135	157
Utah	1	6	7
Total February	877	3,334	4,211
Total January	905	3,429	4,334
Difference	28	95	123

KANSAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Barber	0	0	0	0	0	3
Barton	18	6,567	1	0	0	18
Butler	6	107	2	0	1	9
Cowley	5	796	3	0	1	11
Ellis	15	3,749	0	0	8	18
Ellsworth	2	0	2	0	1	10
Greenwood	2	35	0	0	1	12
Harvey	0	0	0	0	0	1
Jefferson	0	0	0	0	0	1
Johnson	1	0	1	0	0	1
Kingman	2	0	0	2	0	2
Marion	2	75	1	0	1	7
McPherson	12	2,426	1	0	2	15
Pratt	0	0	0	0	0	1
Reno	1	0	0	1	0	0
Rice	13	3,287	1	0	6	23
Rooks	1	300	0	0	1	5
Rush	1	0	0	1	0	0
Russell	17	6,277	2	0	6	24
Stafford	5	1,011	0	0	0	14
Stevens	0	0	0	0	1	3
Sumner	0	0	0	0	1	3
Trego	0	0	0	0	0	1
Woodson	1	28	0	0	0	5
Gove	0	0	0	0	0	1
Miscellaneous	0	0	0	0	2	16
Ttl. Feb.	104	24,658	14	4	32	204
Ttl. Jan.	94	25,022	17	3	46	198
Difference	10	364	3	1	14	6

OKLAHOMA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Beckham	0	0	0	0	1	1
Caddo	8	2,262	2	0	0	14
Carter	6	184	2	0	0	9
Choctaw	0	0	0	0	0	1
Cleveland	0	0	0	2	0	0
Comanche	7	30	4	0	0	1
Creek	18	374	8	0	3	17
Dewey	0	0	0	0	0	1
Garfield	2	10	0	1	0	1
Garvin	1	150	0	0	0	0
Grady	3	220	1	0	0	4
Grant	0	0	0	0	0	1
Hughes	2	0	2	0	1	3
Jackson	7	178	1	2	2	10
Jefferson	0	0	0	0	0	2
Kay	0	0	0	0	3	5
Kingfisher	0	0	0	0	0	1
Kiowa	6	978	4	0	0	1
LeFlore	1	0	1	0	0	0
Lincoln	3	327	1	0	1	9
Logan	0	0	0	0	1	2
Marshall	0	0	0	0	0	3
McClain	0	0	0	0	3	5
McIntosh	0	0	0	0	0	1
Muskogee	1	0	1	0	1	4
Noble	1	929	0	0	1	2
Okfuskee	4	741	0	0	2	6
Oklahoma	2	2,036	0	0	1	6
Okmulgee	4	23	1	0	1	8
Osage	6	201	3	1	1	13
Pawnee	4	64	2	0	2	13
Payne	2	482	1	0	2	6
Pontotoc	12	1,587	3	1	4	13
Pottawatomie	9	4,467	1	0	4	24
Seminole	10	1,321	3	0	6	21
Stephens	4	1,233	2	0	1	8
Tillman	2	1,185	0	0	0	2
Tulsa	1	0	0	1	2	7
Wagoner	4	100	3	0	2	11
Miscellaneous	0	0	0	0	6	39
Ttl. Feb.	130	19,082	46	8	51	275
Ttl. Jan.	127	18,020	46	13	56	297
Difference	3	1,062	0	5	5	22

TEXAS GULF COAST

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Ace	1	0	1	0	0	0
Allen	0	0	0	0	0	1
Anahuac	2	1,327	0	0	0	2
Anchor	1	199	0	0	0	7
Bammel	0	0	0	0	0	1
Barbers Hill	1	242	0	0	1	0
Bay City	1	192	0	0	1	1
Caplen	0	0	0	0	0	2
Cedar Point	0	0	0	0	0	1
Chocolate Bayou	0	0	0	0	0	2
Clam Lake	0	0	0	0	0	1
Clear Lake	4	880	0	1	1	1
Conroe	1	0	1	0	0	0
Danbury	0	0	0	0	0	1
Dickinson	2	478	0	0	1	1
Esperson	1	371	0	0	0	2
Fannett	0	0	0	0	0	1
Fairbanks	4	736	1	0	2	2
Friendswood	5	2,570	0	0	1	2
Ganado	0	0	0	0	0	1
Garwood	1	0	1	0	0	0
Hardin	4	1,030	0	0	2	3
Hastings	2	375	1	0	1	1
Hilje	0	0	0	0	0	1
Hull	1	0	1	0	0	0
Humble	3	576	0	0	1	1
League City	1	238	0	0	0	1
Lockridge	0	0	0	0	0	1
Lovells Lake	4	664	0	0	2	2
Manvel	2	465	1	0	0	1
Martha	0	0	0	0	0	1
Magnet	3	508	0	0	0	1
Markham	3	169	1	0	0	0
Mauritz	1	0	1	0	0	1
Orange	0	0	0	0	0	1
Old Ocean	0	0	0	0	0	6
Orchard	0	0	0	0	0	1
North Cheek	0	0	0	0	0	2
Pickett Ridge	0	0	0	0	0	1
Pierce Junction	1	232	0	0	0	1
Port Neches	0	0	0	0	0	1
Rosenberg	1	75	0	0	0	1
Satsuma	1	0	1	0	0	0
Segno	2	291	1	0	1	3
Seabreeze	0	0	0	0	0	1
Silsbee	0	0	0	0	0	1
Sour Lake	1	225	0	0	0	0
South China	2	0	2	0	0	3
South Cotton Lake	2	218	0	0	1	1
S. Liberty	1	93	0	0	0	0
Spurger	1	179	0	0	0	2
Sugarland	0	0	0	0	0	1
Thompson	7	2,133	0	0	1	3
Tomball	1	379	0	0	0	1
Turtle Bay	0	0	0	0	0	1
Van Vlerk	2	331	0	0	0	1
W. Beaumont	0	0	0	0	0	1
W. Ranch	8	3,711	0	0	2	9
W. Columbia	1	280	0	0	0	4
Withers	4	383	0	0	2	4
Misc.	8	0	8	0	4	16
Ttl. Feb.	91	19,550	21	1	24	109
Ttl. Jan.	96	20,614	22	3	31	110
Difference	5	1,064	1	2	7	1

COASTAL LOUISIANA

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Abbeville	4	767	2	0	0	2
Anse La Butte	1	339	0	0	1	3
Bancroft	2	338	0	0	0	2
Barataria	1	668	0	0	0	3
Bateman Lake	0	0	0	0	0	3
Bay St. Elaine	0	0	0	0	0	1
Black Bayou	0	0	0	0	0	1
Bayou Blue	1	336	0	0	0	1
Bayou de Glaize	0	0	0	0	0	1
Caillou Island	2	572	0	0	0	1
Cameron Meadows	0	0	0	0	0	1
Chalkley	1	0	1	0	0	3
Creole	1	145	0	0	0	1
Chacahoula	1	519	0	0	0	1
Charenton	6	559	1	0	0	2
Chenevylle	0	0	0	0	0	1
Choctaw	0	0	0	0	0	1
Darrow	0	0	0	0	0	1
Dog Lake	0	0	0	0	0	1
E. Baton Rouge	4	738	1	0	1	2
Edgerly	0	0	0	0	0	1
Eola	5	2,562	0	0	0	8
Fausse Point	0	0	0	0	2	0
Garden Island	1	432	0	0	0	1
Gibson	0	0	0	0	0	1
Gillis	2	250	0	0	0	2
Golden Meadow	11	2,284	0	0	4	7
Grand Bay	0	0	0	0	0	2
Grand Lake	0	0	0	0	0	2
Hackberry	1	304	0	0	0	4
Happytown	0	0	0	0	0	1
Horsehoe Bayou	1	340	0	0	1	0
Jeanerette	0	0	0	0	0	1
Jefferson Island	0	0	0	0	0	2
Jennings	1	285	0	0	0	6
Lafitte	1	642	0	0	0	3
La Fourche Crossing	0	0	0	0	0	1
Lake Hermitage	0	0	0	0	0	1
Lake Mongoulois	0	0	0	0	1	0
La Place	0	0	0	0	0	1
Lake Pelto	0	0	0	0	1	1
N. Crowley	1	406	0	0	0	2
New Iberia	1	3,891	0	0	1	6
Paradis	0	0	0	0	0	1
Plumb Bob	0	0	0	0	0	1
Port Barre	0	0	0	0	0	3
Potash	1	0	1	0	0	1
Raceland	0	0	0	0	0	1
Roanoke	1	312	0	0	0	0
Quarantine Bay	0	0	0	0	0	2
S. Jennings	0	0	0	0	0	3
Starks	1	0	1	0	0	0
Sweet Lake	0	0	0	0	0	1
Sulphur	0	0	0	0	0	2
Valentine	1	0	1	0	0	1
Venice	1	147	0	0	0	1
Vermillion Bay	0	0	0	0	0	1
Villa Platte	5	1,398	0	0	0	10
W. Gueydan	1	120	0	0	0	0
W. Lake Verret	0	0	0	0	0	1
White Castle	0	0	0	0	0	1
Woodlawn	0	0	0	0	0	3
Misc.	4	0	4	0	5	25
Ttl. Feb.	64	18,354	12	0	17	143
Ttl. Jan.	76	20,144	12	0	29	127
Difference	12	1,790	0	0	12	16

MISSISSIPPI

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Choctaw	0	0	0	0	0	1
Copiah	0	0	0	0	0	1
Hinds	0	0	0	0	0	1
Issequena	0	0	0	0	0	1
Itawamba	0	0	0	0	0	1
Jeff. Davis	1	0	1	0	0	0
Kemper	0	0	0	0	0	1
Lamar	0	0	0	0	0	1
Monroe	0	0	0	0	0	1
Pike	0	0	0	0	0	1
Prestiss	0	0	0	0	0	1
Sharkey	0	0	0	0	0	1
Simpson	0	0	0	0	0	1
Warren	0	0	0	0	1	1
Yazoo	7	4,070	1	0	2	13
Ttl. Feb.	8	4,070	2	0	3	26
Ttl. Jan.	13	5,210	4	0	4	21
Difference	5	1,140	2	0	1	5

NORTH LOUISIANA

Parish—	Comp.	Prod.	Dry	Gas*	Rgs.	Dig.
Blenville	0	0	0	0	0	1
Bossier	1	35	0	0	1	4
Caddo-Rodessa	0	0	0	0	0	1
Caddo, other	21	920	2	2	3	24
Caldwell	0	0	0	0	0	1
Claiborne	1	655	0	0	0	0
De Soto	0	0	0	0	0	2
La Salle	0	0	0	0	1	3
Morehouse	1	0	0	1	1	0
Natchitoches	0	0	0	0	0	2
Sabine	4	150	2	0	3	6
Tensas	0	0	0	0	0	1
Union	4	0	0	4	0	2
Webster	2	90	1	0	1	4
Ttl. Feb.	34	1,850	5	7	10	51
Ttl. Jan.	46	3,385	16	7	11	47
Difference	12	1,535	11	0	1	4

*Gas production: Caddo Parish, 2,000,000 cu. ft.; Morehouse Parish, 2,362,000 cu. ft.; Union Parish, 7,250,000 cu. ft.

ARKANSAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Clark	0	0	0	0	1	1
Columbia	7	3,685	1	0	1	11
Craighead	0	0	0	0	0	1
Faulkner	0	0	0	0	0	1
Hot Springs	0	0	0	0	0	1
Howard	0	0	0	0	1	1
Lafayette	0	0	0	0	0	1
Little River	0	0	0	0	0	1
Lonoke	0	0	0	0	0	4
Miller-Rodessa	0	0	0	0	0	2
Miller, other	0	0	0	0	0	1
Nevada	2	30	1	0	0	2
Ouachita	0	0	0	0	0	2
Paluski	0	0	0	0	0	1
Saline	0	0	0	0	0	1
Sevier	0	0	0	0	0	1
St. Francis	0	0	0	0	1	0
Union	3	205	1	0	0	6
Ttl. Feb.	12	3,920	3	0	4	38
Ttl. Jan.	15	2,715	5	0	4	37
Difference	3	1,205	2	0	0	1

ALABAMA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Choctaw	0	0	0	0	0	1
Houston	0	0	0	0	0	1
Lawrence	0	0	0	0	0	1
Mobile	0	0	0	0	1	0
Ttl. Feb.	0	0	0	0	1	3
Ttl. Jan.	0	0	0	0	0	3
Difference	0	0	0	0	1	0

FLORIDA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Dade	0	0	0	0	0	1
Levy	0	0	0	0	0	2
Nassau	0	0	0	0	0	1
Suwannee	0	0	0	0	0	2
Ttl. Feb.	0	0	0	0	0	6
Ttl. Jan.	0	0	0	0	0	6
Difference	0	0	0	0	0	0

GEORGIA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Clinch	0	0	0	0	0	1
Dade	0	0	0	0	0	1
Montgomery	0	0	0	0	0	1
Ttl. Feb.	0	0	0	0	0	3
Ttl. Jan.	0	0	0	0	0	3
Difference	0	0	0	0	0	0

EAST TEXAS BORDER

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Bowie	0	0	0	0	0	1
Harrison	1	0	1	0	0	1
Marion-Rodessa	0	0	0	0	0	1
Marion, other	4	20	2	0	0	6
Shelby	0	0	0	0	1	1
Ttl. Feb.	5	20	3	0	1	10
Ttl. Jan.	2	0	1	0	1	12
Difference	3	20	2	0	0	2

SOUTHWEST TEXAS

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dig.
Adami	17	723	0	1	2	8
Agua Dulce	2	0	0	2	0	3
Alice	2	75	1	0	0	1
Ben Holt	4	1,140	0	0	1	4
Benavides	0	0	0	0	0	3
Barbacoas	2	0	2	0	0	0
Bird Island	1	39	0	0	1	0
Byersville	0	0	0	0	0	2
Blas Uribe	1	0	1	0	0	0
Bruni	1	0	1	0	0	1
Cedro Hill	4	136	0	0	1	2
Cedar Creek	0	0	0	0	0	1
Chicon Lake	3	4	0	0	0	0
Charco Redondo	1	0	1	0	0	0
Chiltipin	1	0	1	0	1	0
Clara Driscoll	1	90	0	0	0	2
Colorado	9	844	0	0	1	3
Comitas	0	0	0	0	0	1
Dale	1	672	0	0	0	2
Darst Creek	1	240	0	0	0	2
Day	1	21	0	0	0	0
Driscoll	1	62	0	0	1	0
Eckert	0	0	0	0	0	1
Escobas	2	25	1	0	1	3
East White Point	12	1,632	0	0	4	9
E. Premont	0	0	0	0	0	1
Elm Creek	1	14	0	0	0	1
Fagan	1	157	0	0	0	1
Fitzsimmons	1	58	0	0	0	0
Flour Bluff	0	0	0	0	2	0
Govt. Wells	1	0	1	0	0	0
Gas Ridge	0	0	0	0	0	1
Gutierrez	1	0	1	0	0	0
Heyser	3	562	0	0	1	0
Hoffman	5	310	3	0	1	3
Kelsey	4	67	3	0	1	3
Keeran	1	89	0	0	1	0

Las Animas	1	0	1	0	0	0
La Rosa	5	814	0	0	0	3
Larremore	1	0	1	0	0	0
Longhorn	2	155	0	0	0	1
Luby	0	0	0	0	2	0
Magnolia City	2	184	0	0	0	3
McCampbell	6	663	0	0	2	15
Manda	1	0	0	0	0	0
Margo	0	0	0	0	0	1
McFaddin	1	83	0	0	1	0
Midway	0	0	0	0	0	1
Mirando Valley	6	517	1	0	1	3
Minnie Bock	0	0	0	0	1	2
Mountain View	1	0	1	0	0	0
Muralla	0	0	0	0	1	0
Munson	1	19	0	0	0	1
North Dale	1	0	1	0	0	0
North Luby	0	0	0	0	0	1
Oakville	1	0	1	0	0	0
Pearsall	0	0	0	0	0	1
Peters	0	0	0	0	0	3
Pettus	0	0	0	0	0	1
Placedo	1	68	0	0	1	0
Plymouth	1	128	0	0	0	1
Premont	1	10	0	0	0	2
Rancho Solo	3	980	0	0	1	1
Refugio	1	90	0	0	0	1
Reynolds	2	60	1	0	0	1
Ricaby	1	0	1	0	0	1
Richard King	1	108	0	0	0	1
Riddle	0	0	0	0	0	2
Rincon	2	312	0	0	0	4
Robstown	1	0	1	0	0	0
Rockdale	2	9	0	0	0	0
Salt Flat	1	37	0	0	0	3
Samfordyce	0	0	0	0	0	1
Saxet	0	0	0	0	0	1
Sejita	0	0	0	0	0	1
Seven Sisters	3	0	1	1	0	1
South Clara Driscoll	0	0	0	0	0	5
S. Calliham	0	0	0	0	1	2
Stratton	0	0	0	0	0	2
Sun	3	217	0	0	1	2
Tarancahuas	5	499	3	0	1	1
Tomoconnor	2	1,376	0	0	0	1
Victoria	1	124	0	0	1	1
Volpe	3	235	0	0	0	2
Wade City	1	190	0	0	1	1
White Creek	1	165	0	0	1	1
Misc.	33	0	33	0	11	66
Ttl. Feb.	183	14,003	62	4	46	199
Ttl. Jan	199	15,478	67	8	40	185
Difference	16	1,475	5	4	6	14

WEST TEXAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Andrews	2	2,063	0	0	0	6
Cochran	1	523	0	0	0	0
Concho	0	0	0	0	0	2
Crane	2	4,138	0	0	8	15
Crockett	3	34	2	0	2	4
Ector	45	54,961	0	0	9	60
El Paso	0	0	0	0	0	1
Gaines	10	7,444	1	0	2	16
Hockley	3	4,103	0	0	3	9
Howard	2	2,879	0	0	1	6
Hudspeth	0	0	0	0	0	2
Irion	1	0	1	0	0	1
Loving	1	115	0	0	0	3
Lynn	0	0	0	0	0	2
McCulloch	0	0	0	0	0	1
Mitchell	1	0	1	0	0	2
Nolan	1	9	0	0	0	1
Pecos	11	964	2	0	10	20
Presidio	0	0	0	0	0	1
Reeves	0	0	0	0	0	1
Schleicher	0	0	0	0	0	2
Scurry	8	1,342	0	0	7	11
Stonewall	0	0	0	0	0	2
Terrell	1	0	1	0	0	1
Tom Green	1	0	1	0	0	3
Upton	4	844	0	0	2	8
Ward	14	13,010	1	0	5	19
Winkler	6	5,375	0	0	1	9
Yoakum	33	33,791	0	0	17	77
Ttl. Feb.	150	131.595	10	0	67	285
Ttl. Jan	186	155,064	11	0	87	287
Difference	36	23,469	1	0	20	2

CENTRAL AND NORTH TEXAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Archer	49	24,606	6	0	33	31
Brown	4	0	4	0	2	7
Baylor	4	2,127	1	0	2	3
Callahan	7	127	5	0	10	7
Clay	19	3,491	7	0	25	15
Coleman	4	42	2	1	3	9
Comanche	3	45	1	0	5	5
Cooke	12	3,020	4	0	38	22
Coryell	0	0	0	0	0	1
Denton	0	0	0	0	0	3
Erath	1	0	1	0	2	1
Eastland	2	0	2	0	1	6
Fannin	0	0	0	0	1	0
Fisher	1	5	0	0	0	1
Foard	1	0	0	1	1	1
Grayson	0	0	0	0	1	3
Hamilton	0	0	0	0	0	3
Hardeman	0	0	0	0	0	2
Haskell	1	35	0	0	0	0
Hood	0	0	0	0	0	1
Jack	5	376	4	0	6	8
Johnson	0	0	0	0	0	1
Jones	18	3,482	5	0	10	16
Montague	2	1,840	0	0	9	16
Palo Pinto	0	0	0	0	1	5
Parker	0	0	0	0	0	1
Runnels	0	0	0	0	0	3
Shackelford	17	409	8	1	7	12
Stephens	2	12	1	0	3	7
Tarrant	0	0	0	0	0	2
Taylor	1	91	0	0	0	5
Throckmorton	1	0	0	1	2	2
Wichita	36	14,545	10	0	45	50
Wilbarger	11	4,327	5	0	3	20
Wise	0	0	0	0	0	3
Young	13	1,780	4	0	19	24
Ttl. Feb.	214	60,360	70	4	229	296
Ttl. Jan.	244	86,953	79	7	179	299
Difference	30	26,593	9	3	50	3

CENTRAL AND EAST TEXAS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Anderson	3	138	0	2	0	8
Angelina	0	0	0	0	0	1
Bowie	0	0	0	0	0	1
Camp	0	0	0	0	0	1
Cherokee	0	0	0	0	0	1
Collins	0	0	0	0	0	1
Falls	1	21	0	0	0	1
Fannin	0	0	0	0	0	1
Franklin	1	0	1	0	0	1
Gregg	16	828	0	0	5	9
Henderson	0	0	0	0	0	1
Hill	0	0	0	0	0	1
Houston	4	63	0	3	2	9
Kaufman	0	0	0	0	1	1
Leon	2	59	0	1	0	1
Limestone	0	0	0	0	0	4
McLennan	0	0	0	0	0	1
Navarro	1	0	1	0	1	3
Red River	0	0	0	0	0	1
Rusk	2	13	0	0	5	6
Robertson	0	0	0	0	0	1
Smith	2	667	0	0	2	4
Titus	1	460	0	0	0	0
Trinity	0	0	0	0	1	1
Upshur	3	52	0	0	1	2
Ttl. Feb.	36	2,301	2	6	18	61
Ttl. Jan.	51	2,490	8	6	20	59
Difference	15	189	6	0	2	2

TEXAS PANHANDLE

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Carson	6	2,397	0	1	6	18
Cottle	0	0	0	0	0	1
Deaf Smith	0	0	0	0	0	1
Dickens	0	0	0	0	0	1
Gray	21	6,253	1	1	12	27
Hutchinson	18	5,140	2	0	11	32
Lipscomb	0	0	0	0	0	1
Moore	2	0	0	2	4	7
Motley	0	0	0	0	0	1
Ochiltree	0	0	0	0	0	1
Potter	0	0	0	0	0	2
Sherman	1	0	1	0	0	1
Swisher	0	0	0	0	0	1
Wheeler	1	182	0	0	3	9
Ttl. Feb.	49	13,972	4	4	36	103
Ttl. Jan.	44	13,262	0	7	28	112
Difference	5	710	4	3	8	9

ROCKY MOUNTAIN AREA

New Mexico

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Bernalillo	0	0	0	0	0	2
McKinley	0	0	0	0	0	1
San Juan	2	59	1	0	0	5
San Miguel	0	0	0	0	0	2
Socorro	0	0	0	0	0	1
Torrance	0	0	0	0	0	1
Valencia	0	0	0	0	0	2
Chaves	2	0	2	0	0	6
Dona Ana	0	0	0	0	0	2
Eddy	19	7,282	3	0	18	60
Grant	0	0	0	0	0	1
Lea	37	12,375	1	2	4	49
Luna	0	0	0	0	0	1
Otero	0	0	0	0	0	2
Ttl. Feb.	60	19,716	7	2	22	135
Ttl. Jan.	81	24,606	17	3	17	134
Difference	21	4,890	10	1	5	1

Utah

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Total Feb.	0	0	0	0	1	6
Total Jan.	0	0	0	0	1	6
Difference	0	0	0	0	0	0

Wyoming

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Big Horn	1	0	0	1	0	3
Carbon	0	0	0	0	0	4
Converse	0	0	0	0	1	3
Fremont	0	0	0	0	0	5
Hot Springs	0	0	0	0	0	4
Lincoln	0	0	0	0	0	2
Natrona	0	0	0	0	0	5
Niobrara	6	6,542	0	0	4	12
Park	0	0	0	0	0	1
Sublette	0	0	0	0	1	4
Sweetwater	1	50	0	0	0	3
Uinta	0	0	0	0	0	5
Weston	2	2	1	0	1	6
Misc.	0	0	0	0	0	2
Ttl. Feb.	10	6,594	1	1	7	59
Ttl. Jan.	17	5,349	7	2	9	55
Difference	7	1,245	6	1	2	4

Colorado

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	0	0	0	0	0	1
Boulder	0	0	0	0	0	1
Fremont	0	0	0	0	0	1
Huerfano	0	0	0	0	0	6
La Plata	0	0	0	0	0	1
Larimer	0	0	0	0	0	2
Las Animas	0	0	0	0	0	1
Moffat	0	0	0	0	1	3
Park	0	0	0	0	0	1
Pueblo	0	0	0	0	0	1
Rio Blanco	0	0	0	0	0	2
Routt	0	0	0	0	0	1
Misc.	0	0	0	0	0	4
Ttl. Feb.	0	0	0	0	1	25
Ttl. Jan.	2	250	1	0	1	27
Difference	2	250	1	0	0	2

Montana

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Blaine	0	0	0	0	0	2
Carbon	0	0	0	0	0	1
Fergus	0	0	0	0	0	1
Glacier	6	739	1	0	3	8
Hill	1	0	1	0	0	1
Petroleum	0	0	0	0	0	2
Pondera	0	0	0	0	0	1
Toole	2	200	0	0	0	11
Misc.	0	0	0	0	0	6
Ttl. Feb.	9	939	2	0	3	33
Ttl. Jan.	12	602	2	3	5	37
Difference	3	337	0	3	2	4

ILLINOIS

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Adams	0	0	0	0	0	1
Alexander	0	0	0	0	0	1
Brown	1	0	1	0	0	0
Bureau	0	0	0	0	0	1
Bond	1	0	1	0	1	4
Clark	1	0	1	0	0	7
Clay	5	508	0	0	0	3
Clinton	21	7,676	5	0	13	60
Coles	0	0	0	0	0	2
Crawford	2	0	2	0	2	1
Christian	0	0	0	0	0	1
Cass	0	0	0	0	0	1
Edwards	2	110	1	0	0	2
Edgar	1	0	1	0	0	3
Effingham	0	0	0	0	0	1
Fayette	56	11,070	2	0	7	39
Ford	1	0	1	0	0	0
Gallatin	2	0	2	0	1	3
Hamilton	1	0	1	0	0	2
Henry	0	0	0	0	0	1
Jackson	0	0	0	0	0	2
Jasper	0	0	0	0	0	1
Jersey	0	0	0	0	0	2
Jefferson	3	269	0	0	2	3
Lawrence	2	0	0	2	2	7
Lee	1	0	1	0	0	1
Madison	0	0	0	0	0	2
Marion	111	300,874	2	0	25	127
Massac	0	0	0	0	0	1
McDonough	1	0	1	0	0	1
Macon	1	0	1	0	0	0
Monroe	1	0	1	0	1	8
Montgomery	0	0	0	0	0	5
Peoria	0	0	0	0	0	1
Pike	1	0	1	0	0	0
Pope	0	0	0	0	0	1
Randolph	0	0	0	0	0	6
Richland	15	5,374	0	0	4	13
Saline	0	0	0	0	2	0
Schuyler	1	0	1	0	0	0
Shelby	0	0	0	0	0	4
St. Clair	0	0	0	0	0	3
Tazewell	0	0	0	0	0	2
Wabash	17	1,021	4	0	2	16
Washington	7	300	0	0	1	3
Wayne	15	2,622	2	0	1	15
White	28	4,204	7	1	6	38
Williamson	0	0	0	0	0	3
Iroquois	0	0	0	0	0	1
Vermilion	0	0	0	0	0	1
Ttl. Feb.	298	334,028	39	3	70	400
Ttl. Jan.	173	75,809	32	3	60	388
Difference	125	258,219	7	0	10	12

WESTERN KENTUCKY

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Breckinridge	0	0	0	0	0	2
Caldwell	0	0	0	0	0	1
Christian	0	0	0	0	0	1
Daviess	9	530	1	0	0	17
Hancock	3	10	2	0	0	5
Henderson	0	0	0	0	2	5
Hopkins	0	0	0	0	0	1
Livingston	1	0	1	0	0	2
Logan	0	0	0	0	0	2
McCracken	0	0	0	0	0	1
McLean	1	35	0	0	0	3
Meade	0	0	0	0	0	1
Muhlenberg	0	0	0	0	0	2
Ohio	7	25	5	0	0	12
Todd	0	0	0	0	0	1
Webster	0	0	0	0	0	1
Ttl. Feb.	21	600	9	0	2	57
Ttl. Jan.	25	980	11	0	3	57
Difference	4	380	2	0	1	0

EASTERN KENTUCKY

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Magoffin	1	0	0	0	0	0
Lawrence	1	10	0	0	0	2
Floyd	2	0	0	2	2	9
Pike	0	0	1	0	0	4
Knott	1	0	0	1	1	5
Martin	3	50	0	2	3	5
Breathitt	0	0	0	0	0	1
Morgan	0	0	0	0	0	1
Lee	0	0	0	0	0	1
Rowan	0	0	0	0	0	1
Knox	0	0	0	0	0	1
Wolfe	0	0	0	0	0	1
Carter	0	0	0	0	0	1
Ttl. Feb.	8	60	1	5	6	32
Ttl. Jan.	2	0	0	2	4	13
Difference	6	60	1	3	2	19

Initial production of gas wells 992,000 cu. ft.

OHIO

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Ashland	0	0	0	0	1	1
Athens	3	0	2	1	3	6
Belmont	1	0	1	0	0	1
Coshocton	1	75	0	0	1	2
Cuyahoga	2	0	0	2	1	3
Fairfield	0	0	0	0	0	2
Franklin	0	0	0	0	0	1
Gallia	0	0	0	0	1	1
Guernsey	1	0	0	1	1	10
Hocking	0	0	0	0	0	2
Holmes	0	0	0	0	2	0
Knox	2	0	0	2	3	6
Lawrence	1	0	0	1	3	1
Licking	8	25	2	5	5	17
Lorain	1	0	1	0	1	2
Medina	14	160	1	0	4	10
Meigs	1	0	0	1	2	5
Monroe	0	0	0	0	2	8
Morgan	1	0	1	0	1	3
Muskingum	5	30	2	2	2	4
Noble	4	5	1	2	2	4
Perry	3	45	0	0	3	6
Stark	1	0	0	1	0	5
Summit	1	0	0	1	0	1
Tuscarawas	0	0	0	0	2	5
Vinton	0	0	0	0	0	1
Washington	7	0	2	5	4	8
Wayne	0	0	0	0	0	2
Ttl. Feb.	57	340	13	24	44	117
Ttl. Jan.	54	85	19	27	44	119
Difference	3	255	6	3	0	2

INDIANA

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Clark	0	0	0	0	0	1
Clay	1	0	1	0	0	0
Daviess	2	0	1	1	0	0
Dubois	0	0	0	0	1	3
Gibson	4	429	1	0	2	16
Hancock	0	0	0	0	0	1
Greene	0	0	0	0	0	1
Jay	0	0	0	0	0	4
Jackson	0	0	0	0	0	1
Knox	1	0	1	0	0	4
Lagrange	0	0	0	0	0	1
Madison	0	0	0	0	0	1
Owen	0	0	0	0	0	1
Perry	0	0	0	0	0	1
Pike	0	0	0	0	0	1
Porter	0	0	0	0	0	1
Posey	4	290	1	0	0	11
Putnam	1	0	1	0	0	0
Randolph	0	0	0	0	0	1
Ripley	0	0	0	0	0	1
Spencer	3	5	0	2	1	6
St. Joseph	0	0	0	0	0	1
Sullivan	1	0	1	0	1	2
Vanderburg	1	0	0	0	0	2
Vigo	0	0	0	0	0	1
Warrick	0	0	0	0	0	1
Wayne	1	0	1	0	0	1
Whitley	0	0	0	0	0	1
Ttl. Feb.	19	724	8	3	5	65
Ttl. Jan.	29	2,160	9	3	7	71
Difference	10	1,436	1	0	2	6

MICHIGAN

County—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Allegan	17	1,885	6	0	11	32
Arenac	2	0	1	1	0	0
Barry	1	5	0	0	0	4
Bay	1	0	1	0	0	1
Berrien	0	0	0	0	0	3
Calhoun	0	0	0	0	0	1
Cass	0	0	0	0	0	1
Clinton	0	0	0	0	0	2
Clare	7	6,919	0	0	1	14
Genessee	0	0	0	0	1	0
Gladwin	1	0	1	0	0	0
Gratiot	0	0	0	0	0	1
Isabella	4	312	1	0	4	13
Huron	0	0	0	0	1	0
Jackson	0	0	0	0	1	0
Kalamazoo	1	0	1	0	0	2
Kent	19	1,459	4	0	2	26
Mackinac	0	0	0	0	0	1
Mason	0	0	0	0	0	1
Missaukee	0	0	0	0	1	1
Midland	1	190	0	0	0	5
Monroe	5	600	2	0	4	9
Montcalm	2	0	0	2	1	3
Muskegon	1	0	1	0	0	1
Oakland	0	0	0	0	0	1
Ogemaw	0	0	0	0	0	2
Otsego	0	0	0	0	0	2
Ottawa	29	5,485	4	1	6	18
Newaygo	1	0	0	0	0	0
St. Clair	0	0	0	0	0	2
St. Joseph	0	0	0	0	0	1
Shiawassee	0	0	0	0	0	2
Tuscola	0	0	0	0	2	2
Van Buren	5	75	3	0	3	16
Wexford	0	0	0	0	1	1
Ttl. Feb.	97	16 930	25	4	39	167
Ttl. Jan.	102	22,172	39	3	67	147
Difference	5	5,142	14	1	28	20

EASTERN FIELDS

Field—	Comp.	Prod.	Dry	Gas	Rgs.	Dlg.
Allegany	96	107	0	0	25	83
Bradford	238	267	0	0	61	201
Middle district	13	13	0	2	11	17
Butler-Armstrong	8	14	2	2	4	10
Northern Oriskany	5	0	1	4	4	18
SW Penna.	20	30	5	12	6	41
SE Ohio	32	264	3	10	8	34
W. Virginia	51	56	4	37	18	99
Ttl. Feb.	483	751	15	67	137	509
Ttl. Jan.	454	1,264	40	71	139	497
Difference	29	513	25	4	2	3

WILDCAT OPERATIONS

CALIFORNIA

IMPORTANT WELLS AND NORTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S. T. R.	Depth	Status
Union Oil, No. 4 Le Roy, Santa Maria, Santa Barb.	24-10-35	3,780	sd. sh. drlg.
Hamilton, W. C., No. 1 Hollister, Goleta, Santa Barb.	3- 4-29	1,346	swabbing
T. O. Oil, No. 5 Mdivani, Mesa, Santa Barbara	28- 4-27	2,020	redrlg. 1,792
Merchants Pet., No. 8 Cochran, Sespe, Ventura	16- 4-26	1,570	sd. sh. drlg.
Oil Group, No. 1 Hyland, Summerland, Santa Barb.	1- 4-20	2,095	deep test
Ohio Oil, No. 1 Vail, Moor Park, Ventura	10- 2-19	4,680	sd. sh. drlg.
Sulphur Springs Oil, No. 1 Jones, Conejo, Ventura	33- 2-19	2,501	hd. sd. drlg.
Savage Oil, No. 8 Calumet, Shiells Canyon, Vent....	3- 3-19	4,016	pump 50 b.d.
Rio Hondo Oil, No. 1 Cosby, Hopper Canyon, Vent.	14- 4-19	1,150	sd. sh. drlg.
Continental Oil, No. 15 Grubb, San Miguelito, Vent.	24- 3-24	4,293	sd. sh. drlg.
C. C. M. Oil, No. 6-B Hobson, Rincon, Ventura	17- 3-24	4,276	redrlg. 4,080
C. C. M. Oil, No. 30-B Hobson, Rincon, Ventura	16- 3-24	5,250	P.B. 5,175
C. C. M . Oil, No. 9-A Hobson, Rincon, Ventura	15- 3-24	5,250	gr. sd. drlg.
Tide Water A. O., No. 43 V.L.W., Vent. Ave., Vent.	23- 3-23	9,475	recmtd. 9,460
Tide Water A. O., No. 45 V.L.W., Vent. Ave., Vent.	24- 3-23	8,090	sd. sh. drlg.
Tide Water A. O., No. 17 McGonigle, Vent. Ave., Vent.	23- 3-23	6,370	sd. sh. drlg.
Tide Water A. O., No. 119 Lloyd, Vent. Ave., Vent.	27- 3-23	5,986	sd. sh. drlg.
Tide Water A. O., No. 18 Hartman, Vent. Ave., Vent.	22- 3-23	10,885	redrlg. 9,440
Tide Water A. O., No. 21 Hartman, Vent. Ave., Vent.	22- 3-23	9,860	flow 376 b.d.
Tide Water A. O., No. 22 Hartman, Vent. Ave., Vent.	22- 3-23	1,891	sd. sh. drlg.
Shell Oil, No. 113 Taylor, Ventura Ave., Ventura ...	29- 3-23	7,180	sd. sh. drlg.
Shell Oil, No. 114 Taylor, Ventura Ave., Ventura ...	29- 3-23	4,741	sd. sh. drlg.
Shell Oil, No. 115 Taylor, Ventura Ave., Ventura ...	29- 3-23	5,960	cleaning out
Cal. Alliance Pet., No. 2 Hartman, Vent. Ave., Vent.	22- 3-23	8,410	sd. sh. drlg.
Cal. Alliance Pet., No. 1 Schmidt, Vent. Ave., Vent.	21- 3-23	2,096	sd. sh. drlg.
Lloyd Corp., No. 4 Dabney, Ventura Ave., Ventura	23- 3-23	10,135	cleaning out
Trigg, H. C., No. 1 Den, Devil's Den, Kern	11-25-18	483	cleaning out
Franco-Western Oil, No. 1 Front, McKittrick, Kern	8-30-22	2,090	O.S. drlg.
Mid-State Pet., No. 1 Welport, McKittrick, Kern ...	26-29-21	1,055	sd. sh. drlg.
Union Oil, No. 1 Weston, Belridge, Kern	13-29-21	4,468	sd. sh. drlg.
Belridge Oil, No. 11-1 fee, North Belridge, Kern ...	1-28-20	7,676	br. sh. drlg.
Belridge Oil, No. 23-1 fee, North Belridge, Kern ...	1-28-20	5,966	br. sh. drlg.
Belridge Oil, No. 53-26 fee, North Belridge, Kern ...	28-27-20	8,410	redrlg. 7,790
Texas Co., No. 1 Theta, Shale Hills, Kern	12-28-19	3,291	sd. sh. drlg.
Bishop Oil, No. 2 Buchner, Mount Poso, Kern	20-26-28	101	sd. sh. drlg.
Davis Pet., No. 1 Kernco, Kern Front, Kern	13-28-27	1,294	bailed wet
Dick & Dore Oil, No. 19 Kern, Kern River, Kern ..	34-28-28	202	sd. sh. drlg.
Dick & Dore Oil, No. 20 Kern, Kern River, Kern ..	34-28-28	393	will P.B.
Dick & Dore Oil, No. 21 Kern, Kern River, Kern ..	34-28-28	431	pump 5 b.d.
Dick & Dore Oil, No. 23 Kern, Kern River, Kern ..	34-28-28	580	O.S. drlg.
Dick & Dore Oil, No. 24 Kern, Kern River, Kern ..	34-28-28	310	sd. sh. drlg.
Hast Oil, No. 7 Kern, Kern River, Kern	34-28-28	562	O.S. drlg.
Helfn & Smith, No. 19 Kern, Kern River, Kern	34-28-28	466	no O.S.
El Tejon O. & R., No. 2 Douglas, Edison, Kern	32-29-29	4,002	pump 65 b.d.
Mayes, A. S., No. 1 O.S.E., Edison, Kern	5-30-29	4,160	cleaning out
Goodrum & Vincent, No. 3 S.P., Edison, Kern	31-29-30	803	gr. sd. drlg.
Wood-Callahan Oil, No. 1 Heyden, Edison, Kern ...	21-30-29	4,369	P.B. 3,620
Western Gulf Oil, No. 45-B, KCL, Fruitvale, Kern..	19-30-29	4,677	will deepen
Allied Pet., No. 35 Allied, Mountain View, Kern ...	22-29-27	7,292	sd. sh. drlg.
Western Gulf Oil, No. 1 Ansolabehere, Fruit., Kern	14-29-27	3,050	rig to pump
Standard Oil, No. 2 Bryson, Delano Gas Field, Kern	28-24-23	2,470	3,450 m.c.f.
Standard Oil, No. 4 Mushrush, Wasco, Kern	7-27-24	8,481	sd. sh. drlg.
Continental Oil, No. 5-8-A, KCL, Wasco, Kern	8-27-24	13,157	testing
Continental Oil, No. 1 Meyer, Wasco, Kern	7-27-24	12,277	sd. sh. drlg.
Continental Oil, No. 1 Community, Shafter, Kern ...	12-28-24	11,380	sd. sh. drlg.
Union Oil, No. 32-34, KCL, Rio Bravo, Kern	34-28-25	3,080	sd. sh. drlg.
Union Oil, No. 56-27, KCL, Rio Bravo, Kern	27-28-25	10,940	sd. sh. drlg.
Superior Oil, No. 2 Fink, Rio Bravo, Kern	28-28-25	3,663	sd. sh. drlg.
Superior Oil, No. 3 Smith, Rio Bravo, Kern	34-28-25	7,071	sd. sh. drlg.
Standard Oil, No. 11-23, KCL, Greeley, Kern	18-29-26	10,400	hd. sh. drlg.
Standard Oil, No. 12-7, KCL, Greeley, Kern	7-29-26	11,333	O.S. drlg.
Standard Oil, No. 12-8, KCL, Greeley, Kern	7-29-26	8,091	sd. sh. drlg.
General Pet., No. 1 Oughton, Greeley, Kern	12-29-25	6,994	åd. sh. drlg.
General Pet., No. 2 Sullivan, Greeley, Kern	12-29-25	1,523	sd. sh. drlg.
Shell Oil, No. 72-30-A, KCL, Ten Section, Kern	30-30-26	7,493	sd. sh. drlg.
Shell Oil, No. 34-28-B, KCL, Ten Section, Kern	28-30-26	8,005	sd. sh. drlg.
Tide Water-Cont., No. 33-7-E, KCL, Strand. Kern..	7-30-26	3,030	sd. sh. drlg.
Shell-Ohio, No. 64-12-A, KCL, Strand, Kern	12-30-25	8,570	redrlg. 8,539
Ohio Oil, No. 18-E, KCL, Canal, Kern	13-30-25	7,092	sd. sh. drlg.
Shell Oil, No. 85-15-A, KCL, Canal, Kern	15-30-25	8,250	sd. sh. drlg.
Richfield Oil, No. 74-32-A, KCL, Tupman, Kern	32-30-25	8,190	sd. sh. drlg.
Richfield Oil, No. 72-33-B, KCL, Tupman, Kern	33-30-25	9,166	O.S. drlg.
Richfield Oil, No. 76-29-A, KCL, Tupman, Kern	29-30-25	8,517	repair csg.
Richfield Oil, No. 78-29-A, KCL, Tupman, Kern	29-30-25	6,996	sd. sh. drlg.
Richfield Oil, No. 12-3-C, KCL, Cole's Levee, Kern...	3-31-25	9,260	sd. sh. drlg.
Shell Oil, No. 81-17-B, KCL, Cole's Levee, Kern	17-31-25	10,140	hd. sh. drlg.
Standard Oil, No. 20-2, KCL, Cole's Levee, Kern	9-31-25	9,190	flow 200 b.d.
Ohio Oil, No. 7-F, KCL, Cole's Levee, Kern	3-31-25	9,823	P.B. 9,760
Tide Water A. O., No. 65, KCL, Cole's Levee, Kern	13-31-25	11,050	dry; abd.
Tide Water A. O., No. 72, KCL, Cole's Levee, Kern	14-31-25	9,612	hd. sh. drlg.
Foster, Robert, No. 1 Hollingsworth, Md.-Sun., Kern	22-32-23	1,010	sd. sh. drlg.
General Pet., No. 1 B.V.A., Midway-Sunset, Kern	1-32-24	11,660	hd. sh. drlg.
Signal Oil & Gas, No. 7 Kendon, Mdwy.-Sun., Kern	35-32-23	2,296	sd. sh. drlg.
Shell Oil, No. 45-9 B.V.A., Midway-Sunset, Kern	9-32-25	10,860	sd. sh. drlg.
National Oil, No. 35 Sunset, Midway-Sunset, Kern	35-32-23	1,536	P.B. 1,520
National Oil, No. 36 Sunset, Midway-Sunset, Kern .	35-32-23	1,098	sd. sh. drlg.
McDonald, Joseph, No. 19 Midway, Md.-Sun., Kern	26-31-22	790	sd. sh. drlg.
Texas Co., No. 38 Midway, Midway-Sunset, Kern ...	32-32-24	3,150	pump 127 b.d.
Ohio Oil, No. 43-3-B, KCL, Paloma, Kern	3-32-26	10,361	fish D.P.
Western Gulf-Texas, No. 74-3-A, KCL, Paloma, Kern	3-32-26	10,850	sd. sh. drlg.
Shell Oil, No. 52-2-13-A, KCL, San Emidio, Kern ...	13-11-22	13,880	P.B. 12,430
Burrhus, V. E., No. 1 Haberkern, Elkhorn, Kern ...	21-32-22	2,590	br. sh. drlg.
Oil Scout, Inc., No. 1 Tejon, Comonche Point, Kern	27-32-29	3,630	sd. sh. drlg.
Jergins Trust, No. 1 Cheney, Panoche Creek, Fresno	29-14-13	7,376	sd. sh. drlg.
Texas Co., No. 1 S.P., Turk anticline, Fresno	23-17-15	9,196	sd. sh. drlg.
Standard Oil, No. 71-19-B fee, N.E. Coalinga, Fresno	19-19-16	7,900	O.S. drlg.
Union Oil, No. 68-18 Cook, N.E. Coalinga, Fresno ..	18-19-16	7,890	O.S. drlg.
Amerada Pet., No. 28-17 S.P.L., N.E. Coalinga, Fresno	17-19-16	8,080	hd. sh. drlg.
Bandini Pet., No. 46-18-B, N.E. Coalinga, Fresno...	18-19-16	9,614	C.P. 7,940
Superior Oil, No. 3 Husong, N.E. Coalinga, Fresno .	18-19-16	8,210	flow 1,555 b.d.
Superior Oil, No. 4 Husong, N.E. Coalinga, Fresno	18-19-16	2,274	sd. sh. drlg.
Lytle, R. S., Agent, No. 86-12-C, S.E. Coalinga, Fresno	12-20-15	6,160	br. sh. drlg.
Lytle, R. S., Agent, No. 51-7-F, S.E. Coalinga, Fresno	7-20-16	6,751	br. sh. drlg.
Lytle, R. S., Agent, No. 24-18-F, S.E. Coalinga, Fresno	18-20-16	7,533	O.S. drlg.
Univ. Cons'd. Oil, No. 61-24-C. S.E. Coalinga, Fresno	24-20-15	7,560	hd. sh. drlg.
Texas Co., No. 2 Anderson, S.E. Coalinga, Fresno ..	6-20-16	8,165	flow 756 b.d.
Standard Oil, No. 77-13-C fee, S.E. Coalinga, Fresno	13-20-15	7,390	br. sh. drlg.
Standard Oil, No. 22-19-F fee, S.E. Coalinga, Fresno	19-20-16	6,050	sd. sh. drlg.
Standard Oil, No. 33-19-F fee, S.E. Coalinga, Fresno	19-20-16	5,171	sd. sh. drlg.
Standard Oil, No. 42-19-F fee, S.E. Coalinga, Fresno	19-20-16	7,554	O.S. drlg.
Superior Oil, No. 2-B Cagle, S.E. Coalinga, Fresno	6-20-16	6,880	sd. sh. drlg.
Texas Co., No. 1 Boston, Westhaven, Fresno	14-20-18	9,372	sd. sh. drlg.
Union Oil, No. 9 King, Kettleman N. Dome, Fresno	29-21-17	3,766	sd. sh. drlg.
K. N. D. A., No. 27-18-J, Kettleman N. Dome, Fresno	18-21-17	10,698	sd. sh. drlg.
K. N. D. A., No. 334-18-J, Kettleman N. Dome, Fresno	18-21-17	10,410	hd. sd. drlg.
K. N. D. A., No. 25-16-Q, Kettleman N. Dome, Kings	16-22-18	7,800	completing
K. N. D. A., No. 34-22-Q, Kettleman N. Dome, Kings	22-22-18	6,840	br. sh. drlg.
K. N. D. A., No. 6-26-Q, Kettleman N. Dome, Kings	26-22-18	8,290	sd. sh. drlg.
K. N. D. A., No. 38-26-Q, Kettleman N. Dome, Kings	26-22-18	8,368	cleaning out
Standard Oil, No. 72-19-J, Kettleman N. Dome, Fresno	19-21-17	10,903	redrlg: 10,812
Standard Oil, No. 321-29-J, Kett. N. Dome, Fresno	29-21-17	7,630	sd. sh. drlg.
Standard Oil, No. 57-3-P, Kettleman N. Dome, Kings	3-22-17	7,620	sd. sh. drlg.
Standard Oil, No. 72-17-Q, Kettleman N. Dome, Kings	17-22-18	8,690	salt water
Standard Oil, No. 41-27-Q, Kettleman N. Dome, Kings	27-22-18	6,655	sd. sh. drlg.
Standard Oil No. 63-27-Q, Kettleman N. Dome, Kings	27-22-18	6,473	br. sh. drlg.
Standard Oil, No. 72-27-Q, Kettleman N. Dome, Kings	27-22-18	7,000	sd. sh. drlg.
Standard Oil, No. 83-27-Q, Kettleman N. Dome, Kings	27-22-18	8,090	hd. sh. drlg.
Standard Oil, No. 85-27-Q, Kettleman N. Dome, Kings	27-22-18	6,685	br. sh. drlg.
Standard Oil, No. 41-35-Q, Kettleman N. Dome, Kings	35-22-18	6,415	sd. sh. drlg.
Standard Oil, No. 63-35-Q, Kettleman N. Dome, Kings	35-22-18	8,470	P.B. 8,000
Shell Oil, No. 1 Cohn, Tulare Lake, Kings	4-22-19	10,035	cleaning out
Holly Dev., No. 1 Meherin, Huasno, San Luis Obispo	7-32-13	660	sd. sh. drlg.
Buttes Oilfields, No. 6 Buttes, Marysville, Sutter ..	1-15- 1	7,070	cmtd. 6,958
Richfield Oil, No. 2 Hill, Potrero, Solano	5- 4- 1	2,898	sd. sh. drlg.
Tassajara Oil, No. 1 Rasmussen, Tass., Contra Costa	9- 2- 1	9,360	sd. sh. drlg.

KEY TO ABBREVIATIONS USED IN DRILLING REPORTS

Abd., abandoned.
Acd., acidized.
B.O., barrels of oil.
B.P.D., barrels per day.
B.D., barrels daily.
B.P., back pressure.
B.R., building rig.
B. ck., bottom choke.
Br. sh., brown shale.
B.S., basic sediment.
C.&P., cellar and pits.
Cd. or Crd., cored.
C.D., correct depth.
Cg., coring.
Cmtd., cemented.
C.O., cleaning out.
Comp., completed.
Compr., compressor.
C.P., casing pressure, also cement through perforations.
Csg., casing.
D.D., drilling (or drilled) deeper.
Drlg., or Drg., drilling.
Drk. or Dk., derrick.
D.S., drill stem.
D.S.T., drill-stem test.
D.P., drill pipe.
D.&A., dry and abandoned.
Fsg., fishing.
Gbo., gumbo.
G.I., gas injection.
Gr., gravity.
Gr. sd., gray sand.
Grn. sh., green shale.
Hd. sd., hard sand.
H.F.W., hole full of water.
I.P., initial production.
L., lime.
Lnr., liner.
Loc., location.
M.I.M., moving in material.
M.I.R., moving in rig.
M.I.R.T., moving in rotary tools.
M.O.T., milling on tools.
O.I.H., oil in hole.
O.S., oil sand.
O.T.D., old total depth.
O.W.D.D., old well drilling deeper.
O.W.P.B., old well plugging back.
P.B., plugging back.
P.B.P., pulling or pulled big pipe.
P.L., pipe line.
P.L.O., pipe-line oil.
Pmpg., pumping.
P.O.P., putting on pump.
P.P., pulled pipe.
Rd. sd., red sand.
Rd. sh., red shale.
Recmt., recemented.
Recvd., recovered.
Rmg., reaming.
Redrlg., redrilling.
Rng., running.
R.O.G., rig on ground.
R.P., rock pressure.
R.U., rigging up.
R.U.R., rigging up rotary.
R.U.S.T., rigging up standard tools.
R.&T., rods and tubing.
S. or Sd., sand.
S.D., shut down.
Sdy. sh., sandy shale.
Sdtrk. or St., sidetracked.
S.D.P.L., shut down for pipe line.
S.D.O., or S.D.W.O., shut down awaiting orders.
S.G., show gas.
Sh.&L., shale and lime.
S.I., shut in.
S.I.P., shut in, prorated.
S.L.M., steel-line measurement.
S.O., show oil.
S.O.G.&W., show of oil, gas, and water.
Spdg. or Spd., spudding.
S.R., straightreaming.
Stdg., standardizing (also standing).
S.W., salt water.
Swbg., swabbing.
T.A., temporarily abandoned.
Tbg., tubing.
T.D., total depth.
T. ck., top choke.
T.P., tubing pressure.
Tr., tract.
Tstd., tested.
U.R., underreaming.
W.I.H., water in hole.
W.O., workover.
W.O.C. or W.O.C.S., waiting on cement to set.
W.O.O., waiting on orders.
W.P., working pressure.
W.S.O., water shutoff.
W.S.O.O.K., water shutoff O.K.
W.S.R. or W.O.S.R., awaiting standard rig
Wtr., water.

IMPORTANT WELLS AND SOUTHERN CALIFORNIA WILDCATS

Company, well, location, and county—	S.	T.	R.	Depth	Status
Union Oil, No. 33 Callender, Dominguez, Los Angeles	29-	3-13		6,790	completing
Union Oil, No. 75 Callender, Dominguez, Los Angeles	29-	3-13		7,396	sd. sh. drig.
Shell Oil, No. 102 Reyes, Dominguez, Los Angeles	33-	3-13		6,191	sd. sh. drig.
Havenstrite, R. E., No. 2 Larronde, Dominguez, L. A.	32-	3-13		7,000	sd. sh. drig.
Morton & Elder, No. 2 Dominguez, Dominguez, L. A.	3-	4-13		7,426	P.B. 7,100
Pongratz Pet., No. 1 Grant, Dominguez, L. A.	29-	3-13		7,666	gr. sd.; idle
Apex. Pet., No. 1 Hatfield, Rosecrans, L. A.	20-	3-13		9,002	swab water
St. Anthony Oil, No. 1 Gordon, Rosecrans, L. A.	19-	3-13		7,927	completing
Union Oil, No. 38 Rosecrans, Rosecrans, L. A.	19-	3-13		7,884	sd. sh. drig.
Union Oil, No. 39 Rosecrans, Rosecrans, L. A.	19-	3-13		7,600	sd. sh. drig.
Royalty Service, No. 1 Cement, Rosecrans, L. A.	20-	3-13		9,148	cmtd. 9,134
Kelly & Sons, No. 2 McMillen, Rosecrans, L. A.	20-	3-13		1,241	sd. sh. drig.
El Rey Oil, No. 1 Westmore, Athens, L. A.	2-	3-14		8,430	sd. sh. drig.
Dominguez Estates, No. 1 fee, Torrance, L. A.	2-	4-14		7,168	dry; abd.
Turf Oil, No. 1 H.R.A., Potrero, Los Angeles	34-	2-14		3,876	sd. sh. drig.
Casa Grande Oil, No. 1 Lopez, San Fernando, L. A.	1-	2-15		2,320	bailing
Tide Water A. O., No. 12 Porter, Aliso Canyon, L. A.	27-	3-16		8,207	P.B. 7,551
Tide Water A. O., No. 13 Porter, Aliso Canyon, L. A.	27-	3-16		1,572	sd. sh. drig.
Continental Oil, No. 1 Howell, Aliso Canyon, L. A.	2-	2-16		4,297	gr. sd. drig.
Brit.-American Oil, No. 1 Perkins, Newhall, L. A.	14-	3-16		4,097	sd. sh. drig.
Consolidated Pet., No. 4 Needham, Newhall, L. A.	13-	3-16		4,401	testing
Barnsdall Oil, No. 9 R.S.F., Newhall, Los Angeles	27-	4-17		6,000	sd. sh. drig.
Barnsdall Oil, No. 10 R.S.F., Newhall, Los Angeles	26-	4-17		3,364	sd. sh. drig.
Vesta Pet., No. 1 Palos Verdes, Torrance, Los Angeles	31-	4-13		3,706	cleaning out
Continental Corp., No. 1 L.A.C.F.C., Wilmington, L.A.	2-	5-13		2,141	sd. sh. drig.
Continental Corp. No. 4 L.A.C.F.C., Wilmington, L. A.	2-	5-13		2,979	flow 640 b.d.
Dumm Pet., No. 5 Harbor, Wilmington, L. A.	35-	4-13		3,465	flow 110 b.d.
Hancock Oil, No. 15-A Harbor, Wilmington, L. A.	35-	4-13		2,385	cmtd. 2,380
Hancock Oil, No. 26-B Harbor, Wilmington, L. A.	35-	4-13		4,073	sd. sh. drig.
L. A. Basin Oil, No. 8 Kupfer, Wilmington, L. A.	35-	4-13		3,553	sd. sh. drig.
Long Beach Dev. No. 10-W-X Harbor, Wilm., L. A.	3-	5-13		4,040	sd. sh. drig.
Long Beach Dev., No. 8-Z Harbor, Wilmington, L. A.	2-	5-13		3,398	sd. sh. drig.
O'Donnell, J. E., No. 1 Cliff, Wilmington, L. A.	35-	4-13		1,964	sd. sh. drig.
Union Pacific R. R., No. 131, Wilmington, L. A.	3-	5-13		4,889	cmtd.
Union Pacific R. R., No. 132, Wilmington, L. A.	4-	5-13		3,567	completing
Union Pacific R. R., No. 133, Wilmington, L. A.	3-	5-13		3,860	sd. sh. drig.
Union Pacific R. R., No. 134, Wilmington, L. A.	3-	5-13		2,550	sd. sh. drig.
Union Pacific R. R., No. 135, Wilmington, L. A.	3-	5-13		3,330	sd. sh. drig.
Union Pacific R. R., No. 22-E, Wilmington, L. A.	3-	5-13		3,850	sd. sh. drig.
Union Pacific R.R., No. 5-P.D., Wilmington, L. A.	3-	5-13		2,240	sd. sh. drig.
West Whittier Oil, No. 1 Pellissier, Wilm., L. A.	17-	2-11		4,430	P.B. 3,450
Kern Oil, No. 34 Monterey, Montebello, Los Angeles	2-	2-12		6,696	sd. sh. drig.
Kern Oil , No. 38 Monterey, Montebello, Los Angeles	2-	2-12		7,630	sd. sh. drig.
Union Oil, No. 9 Howard & Smith, Montebello, L. A.	11-	2-12		7,645	flow 631 b.d.
Bush Oil, No. 2 Mihifred, Montebello, Los Angeles	3-	2-12		7,688	O.S. drig.
C. A. P. Oil, No. 1 Dutch, Montebello, Los Angeles	11-	2-12		7,657	redrig. 7,530
Columbia Oil, No. 1 Schelnik, Montebello, L. A.	3-	2-12		7,656	redrig. 7,480
Franru Oil, No. 1 Condaffer, Montebello, L. A.	11-	2-12		7,618	completing
Getty-Pac. West., No. 1 Pfister, Montebello, L. A.	10-	2-12		7,610	completing
Grace Oil, No. 1 Duhrsen, Montebello, L. A.	3-	2-12		4,361	sd. sh. drig.
Herley-Kelly, No. 3 Burke, Montebello, Los Angeles	2-	2-12		7,200	O.S. drig.
Mabee Co., No. 6 Mulholland, Montebello, L. A.	2-	2-12		7,670	sd. sh. drig.
Mabee Co., No. 39 Monterey, Montebello, L. A.	2-	2-12		7,630	sd. sh. drig.
Mabee Co., No. 43 Monterey, Montebello, L. A.	2-	2-12		2,986	sd. sh. drig.
Winlock Oil, No. 1 Win, Montebello, Los Angeles	11-	2-12		7,590	swab dry
Allied Pet., No. 34 Signal, Long Beach, L. A.	30-	4-12		10,065	fish D.P.
Unity Oil, No. 1 Donna, Long Beach, Los Angeles	24-	4-13		....	rigging up
Sunset Oil, No. 1 Alford, Long Beach, Los Angeles	20-	4-12		2,891	rig to pump
Caminol Co., No. 3-19 Dominguez, Long Beach, L. A.	11-	4-13		7,674	P.B. 7,590
Johnson Drlg., No. 40 Signal, Long Beach, L. A.	13-	4-13		2,490	sd. sh. drig.
Texas Co., No. 10-A Davidson, Long Beach, L. A.	19-	4-12		4,715	sd. sh. drig.
Great Northern Oil, No. 1 Oak, Richfield, Orange	28-	3-	9	3,315	cleaning out
Welco Oil, No. 1 Yorba, Richfield, Orange	33-	3-	9	4,800	idle
Mojave Pet., No. 1 Tuffree, Yorba Linda, Orange	21-	3-	9	2,490	fish D.P.
Fullerton Oil, No. 25 Brea, Brea Canyon, Orange	2-	3-10		3,550	cmtd. 3,210
Southwest Expl., No. 25 State, Hunt. Beach, Orange	10-	6-11		4,595	pump 601 b.d
Southwest Expl., No. 26 State, Hunt. Beach, Orange	10-	6-11		1,262	sd. sh. drig.
H. R. O. Oil, No. 1 Hunt., Hunt. Beach, Orange	11-	6-11		4,782	redrig. 2,200
Pacific-Amer. Oil, No. 6 Book, Hunt. Beach, Orange	36-	5-11		3,873	pump 25 b.d.
South Basin Oil, No. 93 H.B., Hunt. Beach, Orange	2-	6-11		7,590	P.B. 3,600
Thompson, M. N., No. 1 Smith, Costa Mesa, Orange	9-	6-10		5,255	sd. sh. drig.

OKLAHOMA

Week Ended March 16

NORTHERN OKLAHOMA

Beckham County

Fred Coogan's No. 1 Kinchen, SE SE SE Sec. 4-9-25w. Drlg. 1,602 ft.

Caddo County

Sinclair Prairie Oil Co.'s No. 1 Groman, SW NW NW Sec. 1-16-13w, Wlx. 9,179 ft.; T.D. 9,904 ft.; drld. plug.

Comanche County

Mid Night Oil's No. 1 Howe, NW NW NE Sec. 30-2-13w. O.W.D.D.; O.T.D. 703 ft.; dpnd. to 998 ft.; acd. and swbd. wtr. and S.S.O.; S.D.

Creek County

Bryan Pet. Co.'s No. 1 Ah-Say. NE NW NE Sec. 34-14-7. Drlg. 2,350 ft.

Indo Oil Co.'s No. 1 Slick, NW NW NW Sec. 1-16-9. Drlg. 370 ft.

Dewey County

Magnolia Pet. Co.'s No. 1 Fiekes. C SW SW Sec. 31-18-14w. D.S.T. rec. mud at 7,718 ft.; drlg. 8,008 ft.

Garfield County

Fain Drlg.'s No. 1 Schnakenburg, NE SE SW Sec. 31-21-4w. Wd. 6,307 ft.; Miss. 6,375-95 ft.; N.S.; Vla. 6,395 ft.; Wlx. 6,515-42 ft., T.D.; D.&A.

Magnolia's No. 1 Kring, C SE SW Sec. 12-21-3w. T.D. 920 ft.

Garvin County

Travis Sanders' No. 1 Buckner, NW NW SW Sec. 27-1-2w. Drlg. 2,530 ft.

Grant County

Continental Oil Co.'s No. 1 Krichmar, SE SE NE Sec. 28-28-5w. Drlg. 4,565 ft.

Hughes County

J. W. Boydston's No. 1 Robstein, C NW SE Sec. 11-6-9. Drlg. 300 ft.

Hall & Jordan's No. 1-A Barker, SE SE SW Sec. 3-8-9. Drlg. 2,045 ft.

Geo. Pace's No. 1 Cahill, C E½ NE SW Sec. 2-6-8. T.D. 2,917 ft.; cd. 2,765-73 ft.; S.S.O.

Walker & Johnson's No. 2 Rogers, NE NE NE Sec. 24-7-9. Drlg. 335 ft.

Kay County

Malarnee Oil Co.'s No. 1 Harris, C SW NE Sec. 14-25-1. T.D. 3,950 ft.; fsg. tools.

Kingfisher County

Phillips Pet. Co.'s No. 1 Drape, C NW SE Sec. 30-18-5w. Drlg. 2,740 ft.

Kiowa County

Frank Dillard et al's No. 1 Hobbs, SE SE NW Sec. 35-6-17w. Set 6⅝-in. 525 ft.; T.D. 690 ft.

Lincoln County

R. M. Purcell et al's No. 1 Wolcott, NW NW NW Sec. 2-13-4e. R.O.G.

Youngblood et al's No. 1 Wright, NE NE SE Sec. 32-16-6. Misenr. 3,929 ft.; Htn. 3,934 ft.; Vla. 4,017 ft.; Wlx. 4,172-79 ft., T.D.; P.B. to 3,955 ft.; shot; P. 104 B.O. in 24 hrs.; I.P. 35 B.O.P.D.; comp.

Logan County

Helmerich & Payne's No. 1 McMahon, SW SW SE Sec. 31-17-1. Hntn. 4,983 ft.; Vla. 5,175 ft.; Wlx. 5,272 ft.; 2nd Wlx. 5,420 ft.; P.B. 5,332 ft.; est. 3,000,000 cu. ft. gas and 12 B.O.P.D.

McIntosh County

Acme Drlg. Co.'s No. 1 Reynolds, NE NE SW Sec. 22-11-14. Booch 1,377-1,412 ft., T.D.; D.&A.

Phillips' No. 1 Blankenship, C SW NW Sec. 33-10-13. T.D. 3,042 ft.; 2,500 ft. W.I.H.

Muskogee County

R. Garrett's No. 1 Encoe, SW SW SE Sec. 16-13-17. Drlg. 1,650 ft.

Okfuskee County

Burke-Greis' No. 1 Dew, NE NE NE Sec. 9-12-9. R.U.S.T.

Payne County

Helmerich & Payne's No. 1 Kramer, NW NW SE Sec. 24-17-1e. Vla. 4,931 ft.; Wlx. 5,014 ft.; cd. 5,015-20 ft.; 2nd Wlx. 5,145 ft.; T.D. 5,157 ft.; N. S.; to test Anton 4,713 ft.

R. L. Kemp's No. 1 Meyer, NW SE SE Sec. 17-17-6. Drlg. 220 ft.

Texas Co.'s No. 1 Burroughs, C E½ NE NW Sec. 11-17-1. Drlg. 3,780 ft.

Pottawatomie County

Alma Oil Co.'s No. 1 Lyday, SE NE SW Sec. 30-6-5. T.D. 3,979 ft.; Schlumbg. showed oil in Earlsboro; perf. 2,602 ft.; 2,730 ft.; mud and S.S.O.; D.&A.

Seminole County

W. A. Mason et al's No. 1-A Reid, NW NW NE Sec. 13-9-7. Cg. 2,246 ft.

Tom Nix' No. 2 Warren, C E½ NE SE SE Sec. 4-6-8. S.D. 930 ft.

Stanolind O. & G. Co.'s No. 1 Aldridge, NW NE SE Sec. 32-9-8. Htn. 4,127 ft.; Vla. 4,304 ft.; 1st Wlx. 4,370 ft.; T.D. 4,394 ft.; fsg. D.P.

Stephens County

Edwin Bristow's No. 1 Damron, SE NW SW Sec. 25-2s-6w. T.D. 1,545 ft.

Washita County

Continental Oil Co.'s No. 1 School ld., C NE Sec. 16-8-16w. T.D. 285 ft.; drlg. plug.

SOUTHERN OKLAHOMA

Atoka County

Brookshire et al's No. 1 Jones, C SW NW Sec. 29-3s-12. T.D. 2,045 ft.; lost bit; may test Mayes at 1,045 ft.

Carter County

W. F. Turner's No. 1 Smith, NE SW SE Sec. 16-3s-1w. S.D. 3,640 ft.

Choctaw County

Clyde Ross et al's No. 1 Hardy, SE SE NW Sec. 21-7s-15. T.D. 1,916 ft., sdy. L. and S.S.O.; S.D.

Jackson County

Jones & Robinson's No. 1 Neal, SW SW SW Sec. 8-1s-20w. Rig.

Jefferson County

Fred Land et al's No. 1 Barrett, NE SE SE Sec. 14-8s-6w. Sd. 1,852 ft., S.O.; D. P. stk. at 1,100 ft.; T.D. 1,890 ft.; S.D.

Marshall County

Johnson et al's No. 1 Godfrey, SW SE NE Sec. 14-6s-6e. Vla. 2,627 ft.; S.S.O.; T.D. 4,455 ft. in sd.; S.O.; S.D.

May Oil Corp.'s No. 1 Sacrea, SW NE SW Sec. 17-5-5. Sd. and S.G. 1,023-27 ft.

Pure Oil's No. 1 Little, W½ NE SE Sec. 28-5s-7e. Drlg. sh. 5,073 ft.

Murray County

C. P. Williams' No. 1 fee, NE NE SE Sec. 22-1n-4. Arb. 685 ft.; S.D. 790 ft.

Stephens County

Edwin Bristow's No. 1 Damron, SE NW SW Sec. 25-2s-6w. T.D. 1,545 ft.

KANSAS

Week Ended March 16 (Descriptions are East unless marked otherwise)

Barton County

Phillips' No. 1 Wondra, CWL SW NE Sec. 15-17-12w. Lans. 3,049 ft.; 700 ft. O.I.H., 10 hrs.; congl. 3,292 ft.; Arb. 3,316 ft.; S.O.&W. 3,318-20 ft.; H.F.W. 3,325 ft., T.D.; P.B. to 3,054 ft.; drld. cmt. to 3,090 ft.; 450 ft. O.I.H.; P. 47 B.O. in 4 hrs.

Butler County

Atlantic and Sinclair's No. 1 Smith, SE SE NW Sec. 33-33-4. Drlg. 2,108 ft.

Cowley County

Atlantic and Sinclair's No. 1 Smith, SE SE NW Sec. 33-33-4. Tpka. 1,365 ft.; drlg. 2,785 ft.

C. L. Carlock's No. 1 Starkey, CSL SE SE Sec. 21-30-7, Spd.

Markey & Talbot's No. 1 Anderson, C N½ NE NW Sec. 21-30-3. Drlg. 2,555 ft.

Markey & Mission's No. 1-A Hunt, SW SW NE Sec. 16-34-5. Drlg. 1,575 ft.

C. F. Meyers' No. 1 Dunn, NW NW NW Sec. 33-34-5. Drlg. 3,085 ft.

Ellsworth County

Lauck & Moncrief's No. 1 Ehler, CWL SW NW Sec. 35-16-10w. Lans. 2,943 ft.; Arb. 3,295-97 ft.; S. 33 B.O. in 2 hrs.; T.D. 3,318 ft.; S. 32 B.O.

Greenwood County

A. A. Hinze et al's No. 1 Hester, NW SW NE Sec. 1-22-12. S.D. 510 ft.

Marylyn Oil's No. 1 Burke, NE NE SW Sec. 27-24-11. Set 10-in. 685 ft.; S.D. 725 ft.; T.D. 825 ft.

C. L. Sheedy et al's No. 1 Hook, NW SW NW Sec. 4-22-10. T.D. 3,244 ft. in Miss.; S.S.O.

Jefferson County

McLaughlin Sons, Inc.'s No. 1 McLaughlin, SW NE NW Sec. 4-10-20. T.D. 1,915 ft.; whpstk. 1,858 ft.; P.B. 1,550 ft.; S.D.

McPherson County

Aladdin Pet. Co.'s No. 1 Bitikofer, CNL NE NW Sec. 1-20-1w. Cellar.

Marion County

Harrington & Lorieaux's No. 1 Belton SE SE NE Sec. 30-17-4. S.D. 1,230 ft.

H. H. Royer's No. 1 Kroch, NE NE NW Sec. 28-18-4. Drlg. 1,830 ft.

Reno County

Dutton et al's No. 1 Green, SE SE SE Sec. 8-23-4w. S.D. 901 ft.

Rooks County

Seaney & Clampitt's No. 1 Morrison, CSL SW NE Sec. 32-10-17w. Loc.

Russell County

I. W. Murfin et al's No. 1 St. Aubyan, CSL SW SE Sec. 1-15-15w. Tpka. 2,710 ft.; Lans. 3,000 ft.; drlg. 3,077 ft.

Sedgwick County

G. A. Fuller's No. 1 Stilt, CSL SE NE Sec. 21-27-1w. S.S.O. 2,078 ft.; incr. at 2,798-2,800 ft., T.D.; W.O.C.

Sunray Oil Co.'s No. 1-A McMillan, CWL NW NW Sec. 14-29-2w. Miss. 3,564 ft.; D.S.T. 3,575 ft. and rec. S.O. and mud; Arb. 4,030-55 ft., T.D.; P.B. 3,590 ft.; W.O.C.

MISSOURI

Adair County

Ettington et al's No. 1-A Clark, NE NE SE Sec. 8-63-14w. Drlg. 540 ft.

Holt County

Brin & Nathan's No. 1 Decker, C NW NW Sec. 1-61-38w. T.D. 1,030 ft.; S.D. for csg.

Platte County

Geo. Vincent et al's No. 1 Dillingham, C NE SW Sec. 16-53-34w. T.D. 1,055 ft.; S.D. to run 8-in. csg.

Schuyler County

T. E. Baldwin's No. 1-A Johnson, NW NE NE Sec. 21-65-15w. Vla. 1,280 ft.; T.D. 1,505 in Arb.; pulling 6-in. csg.

Rogers & Morrow's No. 1 Seamster, Sec. 6-65-13w. Drlg. 905 ft.

IOWA

Union County

Phillips Pet. Co.'s No. 1 Creston, C SE NE Sec. 31-71-30w. Hntn. 1,595 ft.; drlg. 2,605 ft.

NEBRASKA

Cass County

Golden Rod Oil Co.'s No. 1 Sparer, SE SE SE Sec. 8-11-13e. S.D. 1,205 ft., Vla. L.

Dakota County

Peder Skriver's No. 1 Armor, NE NE NE Sec. 33-28-8. T.D. 1,100 ft.; S.D.

Dawes County

G. E. Mitchell's No. 1 Palmer, NW NW SW Sec. 1-33-50w. (O.W.D.D.); O.T.D. 2,964 ft.; R.U. to D.D.

Fillmore County

Dan Kornfeld's No. 1 Mathis, NE NE NE Sec. 22-5-1w. S.D. 2,003 ft.

Keith County

California-Nebraska Oil, Ltd.'s No. 1 Guststuehm, NW NW NW Sec. 21-14-37w. Dak. 2,772 ft.; S.O. 2,895-2,901 ft.; cd. 3,258-61 ft.; S.O.; S.D. 3,300 ft.

Pawnee County

Blaser & Hoerman's No. 1 Wilson, NE NW NW Sec. 4-1-10. S.S.O. 470-71 ft.; drlg. 476 ft.

Richardson County

Pawnee Royalty's No. 1 Boice, CSL N½ NE NE Sec. 18-1-16e. Hntn. 2,276 ft.; dpnd. to 2,292 ft.; P.&F. 78 B.O. and 403 B.W.; S.I.; stor.

Stephens & Uhri's No. 1-A Ogle, NW SE SE Sec. 9-1-14. R.T. on ground.

Stephens & Uhri's No. 1 Stauffer, SW SW NE Sec. 21-1n-13e. S.D. 475 ft.

ARKANSAS

Arkansas County

J. M. Hazelwood et al's No. 1 L. Miller, 1,980 ft. S, 667 ft. W, NE cor. NE¼ Sec. 33-5s-4w. Set 10¾-in. csg. 537 ft.; drlg. 4,366 ft.

Clark County

J. H. Coker and J. P. Grieves' No. 1 C. McClellan, 330 ft. NW cor. NW SE Sec. 11-20-21. Set 8¼-in. csg. 43 ft.; W.O.C.

W. S. King's No. 1 N. Ross, 640 ft. S, 359 ft. W, NE cor. S½ SW Sec. 3-10-21. T.D. 2,050 ft.; S.D.; fuel.

Columbia County

Atlantic Ref. Co.'s No. 1 Gunnels, 182 ft. N, C SW SW Sec. 19-17-19, T. Smkvr. L. 7,455 ft.; T.D. 7,573 ft.; rng. 5½-in. csg.

Jas. Forgotson's No. 1 L. M. Dendy, C SW SW Sec. 24-17-19. Set 13⅜-in. csg. 120 ft.; set 9⅝-in. csg. 2,235 ft.; drlg. 3,710 ft.

Hassie Hunt's No. 2 McWilliams, NE NE Sec. 16-18-19. 9⅝-in. csg. 2,109 ft.; set 5½-in. csg. 8,250 ft.; would not flw.; rkd. with gas and attempted acd; would not take acd.; drld. to 8,265½ ft.; W.O.

McAlester Fuel Oil Co.'s No. 1 H. Sayers unit, C NE NW Sec. 15-18-22. Set 9⅝-in. csg. 4,060 ft.; drlg. rd. sdy. sh. 6,820 ft.

Mid-Continent Pet. Corp. et al's No. 1 R. S. Foster, 100 ft. N, C SE SW Sec. 24-17-20. Drlg. rd.&gr. sh. 6,012 ft.

Normandie Oil Corp.'s No. 1 D. R. Booth, C N½ NE NW and N½ NW NE Sec 25-17-20. Drlg. 4,464 ft.

Shell Oil Co., Inc.'s No. 2 Peoples Bnk. of Columbia, C SW SW Sec. 24-17-20. Drlg. 4,460 ft.

Tide Water Asso. Oil Co. and Seaboard Oil Corp.'s No. 1 W. T. Beene, C NE NW Sec. 14-18-19. R.U.

Tide Water Asso. Oil Co. and Seaboard Oil Corp.'s No. 2 J. T. Beene, C NE NW Sec. 15-18-19. Set 13⅜-in. csg. 132 ft.; drlg. rd. sd.&sh. 7,963 ft.

Tide Water-Seaboard Oil Co.'s No. 1 W. Mack, C SW NE Sec. 16-18-19. Fsg. 7,-631 ft.

G. H. Vaughn's No. 1-D J. Jones, 495 ft. S, 660 ft. W, NE cor. NE SE Sec. 21-17-20. T.D. 7,634 ft.; set 6-in. csg. 7,-600 ft. (cor.); flwd. 154 bbl.; ¼-in. ck.; C.P. 400 lb.; T.P. 750 lb. and went dead; swbg. to test.

Craighead County

Tennark, Inc.'s No. 1 R. M. Martin, SE cor. NE NE Sec. 35-14-3e. T.D. 5,092 ft.; ran electric log; S.D.; hd. L.

Lonoke County

Lunnon Howell & Ford's No. 1 City of Cabot, C NE Lot 1, Blk. 6, Sec. 18-4n-9w. Set 4¾-in. csg. 878 ft.; T.D. 900 ft.; reported S.O.; prep. test.

J. F. Russell's No. 1 J. T. Gunter, 440 ft. N, 577 ft. W, SE cor. Sec. 17-5n-10w. Drld. sd. S.S.O. 2,231-45 ft.; drlg. sd., strks. sh. 2,247 ft.

Miller County

Skelly Oil Co. and Pacific Western Oil Corp.'s No. 1 E. C. Wallis, C S½ SE SE Sec. 7-20-27. Set 9-in. csg. 1,948 ft.; drlg. L.&sh. 5,825 ft.

Standard Oil Co. of La.'s No. 1 W. P. Sturgis, 660 ft. S and W, C Sec. 1-17-27. Set 9⅝-in. csg. 2,497 ft.; drld. sd. &sh. 2,900-23 ft.; S.O.; cd. 2,923-30 ft.; rec. sd.&sh.; S.O.; D.S.T. 2,896-2,931 ft.; rec. 180 ft. oil-cut mud and 90 ft. mud in 30 min.; drld. sd. S.O. 3,585-90 ft.; cd. 3,590-3,600 ft.; rec. 9½ ft. sat. sd.; D.S.T. 3,584-3,600 ft. rec. 2,-700 ft. oil and gas, no wtr. in 25 min.; cg. 3,868 ft.

Nevada County

Berry Asphalt Co.'s No. 9 Groves Ld. & Tmbr. Co., 330 ft. S and W, C Sec. 10-14-20. Set 10-in. csg. 28 ft.; 500 ft. F.I.H.; W.O.S.R.; T.D. 1,266 ft.; C.O.

Velma Oil Co.'s No. 1 T. M. Bemis, 330 ft. NW cor. NW NE Sec. 23-10s-22w. Set 10-in. csg. 66 ft.; S.D. 68 ft.

Ouachita County

Liberty Oil Co.'s No. 1 P. T. Hildebrand, 660 ft. S, 330 ft. W, NE cor. SE¼ Sec. 28-15-15. O.W.W.O.; O.T.D. 4,934 ft.; reperf. csg. 2,600-25 ft.; tstd. S.W. and recmtd. perf.; arng. reperf.; T.D. 2,-784 ft.; M.I.C.T.

Saline County

A. W. Givens' No. 1 Williams, 375 ft. S, 420 ft. E, NW cor. NE NE Sec. 18-3s-15w. Drlg. L.&sh. 406 ft.

Sevier County

R. A. McArthur's No. 1 Bell est., 20 ft. SE cor. SE SW Sec. 29-9s-32w. S.D. 732 ft.

St. Francis County

D. T. Hargraves et al's No. 1 J. T. Wellford, 400 ft. N, 300 ft. W, SE cor. NE NE Sec. 29-4n-1w. R.U.

Union County—Schuler

Delta Drlg. Co.'s No. 1 J. C. Morgan, 330 ft. S and W, C Sec. 13-18-18. Set 9⅝-in. csg. 1,537 ft.; drlg. 3,700 ft.

Union County—Other

Berg & Laney's No. 1 Cutrer, 150 ft. N, 660 ft. W, SE cor. NW SW Sec. 21-17-14. Cd. 2,727-28 ft.; rec. 7-in. por. sd.; cd. 2,728-35 ft.; rec. 7½ ft. soft por. sd., salty taste; drlg. by fish 350 ft.; T.D. 3,370 ft.; set 5⅞-in. csg. 2,771 ft.; perf. 2,702-05 ft.; bailed down 1,000 ft. and tstd. S.W.; prep. recmt. perf.

Kinard Curtis et al's No. 1 J. A. Kelly, 330 ft. SW cor. SE SW SW Sec. 9-17-14. Set 10-in. csg. 203 ft.; S.D.; 1,820 ft.; rig repair.

McCressien Oil Co.'s No. 3 J. C. Parker, 250 ft. N, 400 ft. E, SW cor. Sec. 3-18-13. M.I. rlg.

LOUISIANA

NORTH LOUISIANA

Bossier Parish

Gulf Ref. Co.'s No. 20 C. B. Hodges, 3,-131 ft. N, 1,388 ft. W, SE cor. Sec. 24-16-12. T. Pett. L. 5,298 ft.; T. Trv. Pk. 5,590 ft.; D.S.T. 8,261-93 ft.; tstd. 220 ft. mud; T.D. 8,647 ft.; no show; P.B. 1,640 ft. to clk.; perf. 1,550-62 ft.; W.O.S.R.

Premier Dev. Co.'s No. 1 Mehaffey, 150 ft. S, 1,980 ft. W, NE cor. Sec. 27-19-11. Set 12½-in. csg. 155 ft.; W.O.C.

Triangle Drlg. Co.'s No. 1 Chatman, Sec. 18-18-11. Set 8⅝-in. csg. 2,401 ft.; drlg. sh. 2,200 ft.

Union Prod. Co.'s No. 2-B Thigpen & Herold, 1,245 ft. S, 1,388 ft. E, NW cor. Sec. 19-17-11. Drlg. sh. 1,062 ft.

Caddo Parish

Baker & Wissman's No. 1 Muslow, Sec. 31-21-15. R.U.

Beaudon & Griffin's No. 1 Davidson, Sec. 26-21-16. R.U.

F. W. Burford's No. 2 Atkins, Sec. 5-23-15. 9⅝-in. csg. 850 ft.; drlg. L. 6,007 ft.

L. M. Calhoun's No. 1 Crawford, Sec. 32-21-15. R.U.

Hugh Carney's No. 2 Burton, Sec. 1-20-16. Set 10-in. csg. 40 ft.; drlg. 250 ft.

D. T. Cauble's No. 1 Darnell, Sec. 17-22-16. Set 10-in. csg. 80 ft.; T.D. 2,800 ft.; rng. electrical log.

Davidson & Brown's No. 1 Wells, Sec. 10-21-15. Set 8-in. csg. 1,597 ft.; acd. with 4,000 gal.; pmpd.; S.O. 1,789 ft.; cg. 2,447 ft.

Duncan & Harrison's No. 1 Carter, Sec. 9-21-16. Set 10-in. csg. 42 ft.; set 7-in. csg. 1,058 ft.; tstd. dry 1,072 ft.; drlg. sh.&sd. 2,045 ft.

Galbraith & Mealey's No. 20 Raines, Sec. 22-21-15. Set 6⅝-in. csg. 1,474 ft.; T.D. 1,625 ft.; will acd.

L. O. Gandy's No. 1 Etchinson, Sec. 11-20-16. Set 10-in. csg. 40 ft.; drlg. sdy. sh. 1,345 ft.

J. H. Hooker's No. 1 Muslow, Sec. 5-20-15. T.D. 1,427 ft.; stk. 6-in. csg. 1,313 ft.

Kendricks & Bashaw's No. 1 Huckaby-Parker, Sec. 14-22-16. T.D. 1,616 ft.; ran electrical log; W.O.

Magnolia Pet. Co.'s No. 31 Dillon, Sec. 23-21-15. Set 6⅝-in. 1,524 ft.; T.D. 1,-655 ft.; W.O.C.

J. Ray Murray's No. 1 Chesire, Sec. 32-21-15. Set 6⅝-in. csg. 1,398 ft.; T.D. 1,592 ft.; W.O.C.

J. S. Pate et al's No. 1 Querbes, Sec. 18-21-15. Drlg. sh.&sd. 1,325 ft.

Providence Oil Co.'s No. 6 Bostwick, Sec. 13-22-16. Set 10-in. csg. 105 ft.; W.O.C.

Stanolind O. & G. Co.'s No. 2 Alexander, 670 ft. E, 2,461 ft. S, NW cor. SE Sec. 21-21-15. Acd. with 3,000 gal.; T.D. 1,-750 ft.; W.O.S.R.

Stanolind O. & G. Co.'s No. 4 Noel, Sec. 24-21-15. Drlg. sh. 710 ft.

H. J. Strief's No. 3 Noel est., Sec. 12-20-16. Drlg. sh. 800 ft.

Jack Terrell's No. 1 Welch, Sec. 3-20-16. Set 6-in. csg. 946 ft.

Texas Co.'s No. 6 La. Co. fee, Sec. 1-20-16. Set 6⅝-in. csg. 1,328 ft.; T.D. 1,-335 ft.; W.O.C.

W. & W. Oil Co.'s No. 4 Ark. F. O. Co., Sec. 12-20-16. S.D. 1,150 ft.; jnkd. hole 1,150 ft.; skd. over 40 ft.; set 10-in. csg. 40 ft.; set 6-in. csg. 1,389 ft.

Sloan Wells' No. 1 Stiles, 3,734 ft. N, 1,706 ft. E, SW cor. Sec. 32-21-16. Set 10-in. csg. 340 ft.; set 6⅝-in. csg. 2,-298 ft.; W.O.C.

Ivan W. Wright's No. 1 Moore, Sec. 1-20-16. Set 10-in. csg. 40 ft.; T.D. 1,345 ft.; S.D.; will set csg.

De Soto Parish

Dewey Juan's No. 1 Frost Lbr. Ind., 600 ft. SE cor. SW¼ Sec. 14-22-3e. T. D. 2,949 ft.; bailed down 2,300 ft.; S. S.O.; tstd. S.S.O.&S.W.; cd. to 2,938 ft. (cor.) and S.D.; rig repairs.

Watts O. & G. Co.'s No. 1 Frank Gro. Co., 338 ft. S, 450 ft. W, NE cor. NW Sec. 35-12-11. Br. sd. 2,503-2,634 ft.; set 6-in. csg. 2,503 ft.; T.D. 2,634 ft.; W.O.C.

La Salle Parish

Georgetown Oil Co.'s No. 4 Baldridge, 300 ft. S, 250 ft. E, NW cor. NE NW Sec. 11-9-1e. Set 10-in. csg. 60 ft.; drlg. sh. 1,448 ft.

H. L. Hunt and Ark. Fuel Oil Co.'s No. 1 Goodpine Lbr. Co., C NW NW Sec. 18-10n-3e. Fsg. 3,030 ft.; blew out and bridged at 1,200 ft.; drld. bridge and twisted off 2,000 ft. D.S.; left wall hook in hole while fsg.; P.B. 900 ft.; whpstk. 900 ft.; ran Schlmb. to 3,039 ft.; drlg. hd. sdy. sh. 8,821 ft.

Placid Oil Co.'s No. 9 Cent. La., 810 ft. S, 150 ft. W, NE cor. Sec. 13-10-2e. Cd. 2,884-2,903 ft.; soft, gr. por. sd.; S.O.; sd. 2,397-2,409 ft.; S.O.; set 5½-in. csg. 2,396 ft.; T.D. 2,401 ft.; O.T.D. 2,993 ft.; tstd. 3,000,000 cu. ft. gas and 600 bbl. S.W.; S.S.O. through ¾-in. ck.; T.P. 200 lb.

Madison Parish

Gulf Ref. Co.'s No. 1 Sondheimer, 175 ft. N, 35 ft. W, C Sec. 33-18-12e. Spd.; set 13⅜-in. csg. 169 ft.; T.D. 186 ft.; arng. run electrical log 2,884 ft.

Morehouse Parish

Southern Carbon Co.'s No. 28 Tensas, 1,333 ft. N, 1,263 ft. W, SE cor. Sec. 10-21-4e. Drlg. 75 ft.

Natchitoches Parish

J. E. Watts' No. 1 Tanner est., 330 ft. SW cor. NW¼ Sec. 18-10-10. Set 10-in. csg. 60 ft.; W.O.C.

Sabine Parish

A. R. Chestnut's No. 1 Logan, 330 ft. SW cor. NW NW Sec. 26-10-13. Drlg. 40 ft.

R. Chestnut's No. 1 Walden, 330 ft. SE cor. NE NE Sec. 27-10-13. Set 10-in. csg. 42 ft.; set 7-in. csg. 1,458 ft.; T.D. 2,006 ft.; pmpd. S.W.; S.O.; W.O.S.R.

N. B. Livingston's No. 1 Bowman Hicks, 660 ft. SE cor. SW Sec. 36-9-14. Set 10-in. csg. 110 ft.; D.S.T. 3,125-59 ft.; ¼-in. cks. T.&B.; 35 min.; rec. 150 ft. mud and S.G.; rng. 5½-in. csg. 3,508 ft., T.D.; tstd. gas 3,462-3,535 ft.; perf. between 3,134 ft. and 3,462 ft. and tstd. est. 1,000,000 cu. ft. gas, S.O., and S.W.; P.B. 3,200 ft.; tstd. S.W.; S.O. 3,134-50 ft.; acd. with 1,500 gal.; tstd. S.W. and 50 B.O.; T.D. 3,170 ft.; W.O. S.R.

Major Oil Co.'s No. 2 Sabine, 330 ft. SE cor. SE SW Sec. 5-7-13. Set 7-in. csg. 2,061 ft.; T.D. 2,475 ft.; W.O.S.R.

Geo. L. Pace's No. 1 Logan Oil Co., 390 ft. S, 300 ft. E, NW cor. SW Sec. 26-10-13. Set 10-in. csg. 100 ft.; W.O.C.

J. H. Thames' No. 1 Long Bell, 330 ft. SW cor. NE SE Sec. 5-8-13. T.D. 1,708 ft.; set 7-in. csg. 1,680 ft.; did not tst. 1,708 ft.; T.D. 1,987 ft.; acd. with 1,-000 gal.; tstg. 1,987 ft.

Union Parish

Memphis Nat. Gas Co.'s No. 1 Barr, Sec. 3-21-2. R.U.

Memphis Nat. Gas Co.'s No. 1 J. B. Lankford, Sec. 10-21-3. Set 12½-in. csg. 165 ft.; W.O.C.

Webster Parish

Hassie Hunt's No. 2 Coyle, C SW SE Sec. 22-21-10. No Hllwy. sd.; P.B.; set 5,918 ft.; T.D. 6,294 ft.; tstd. good S. O.; S.D.; W.O.

Hunt Oil Co.'s No. 1 Gaines, 50 ft. NW C NW NE Sec. 30-21-9. Set 9⅝-in. csg. 5,615 ft.; no Hllwy. sd.; D sd. 8,501-05 ft. (oil); drlg. sdy. sh. 8,549 ft.

Hunt Oil Co.'s No. 1 Jordan, 660 ft. N, 560 ft. W, SE cor. NE Sec. 31-21-10. No Hllwy. sd.; drlg. sh. 8,209 ft.

Hunt Oil Co.'s No. 5 Stewart, 660 ft. N, 560 ft. E, SW cor. NW¼ Sec. 29-21-10. Set 9⅝-in. csg. 5,610 ft.; drlg. hd. sd. 7,579 ft.

Midstates Oil Corp.'s No. 1 Brenner-Beamsley unit, 100 ft. SE cor. SW SE Sec. 20-21-10. R.U.

Quad Oil Co.'s No. 3 Gray, 105 ft. SE cor. NE SE Sec. 27-21-10. Set 13⅜-in. csg. 640 ft.; drlg. sh. 4,619 ft.

SOUTH LOUISIANA FIELDS

Abbeville—Vermilion Parish

Continental Oil Co.'s No. 1 Boudoin, Sec. 64-12s-3e. 13⅜-in. csg. 1,776 ft.; drlg. sh. 4,520 ft.

Continental Oil Co.'s No. 1 Motty, Sec. 18-12s-3e. T.D. 10,444 ft.; sdtrkd.; drlg. sh. 10,262 ft.

Anse La Butte—St. Martin Parish

Glassell & Glassell's No. 2 Breaux, Sec. 118-9s-5e. Drlg. sh. 4,556 ft.

Glassell & Glassell's No. 1 Moresi, Sec. 121-9s-5e. Drlg. sh. 220 ft.

Iberia Pet. Co.'s No. 1 A. P. Moresi, Sec 118-9s-5e. T.D. 2,250 ft.; tstg.

Emer Line Oil Co.'s No. 1 Nickerson, Sec. 86-9s-5e. T.D. 2,634 ft.; P.B. 1,-000 ft.

Bancroft—Beauregard Parish

Republic Prod. Co.'s No. 15 Columbia Ld. Co., Sec. 21-6s-13w. Cg. 7,298 ft.

Republic Prod. Co.'s No. 16 Columbia Ld. Co., Sec. 21-6s-13w. T.D. 7,288 ft.; 5½-in. csg. 7,288 ft.; T.S. 7,276 ft.; I. P. 230 B.P.D.; ¼-in. ck.

Barataria—Jefferson Parish

California Oil Co.'s No. 1 Danciger-State, Sec. 2-16s-23e. Loc.

California Oil Co.'s No. 1 State-Bayou, Twp. 16-23e. 10¾-in. csg. 2,002 ft.; drlg. sh. 5,571 ft.

California Oil Co.'s No. 1 Zeringue-Community, Sec. 2-16s-23e. Cg. 8,280 ft.

Carter, Perrin & Brian's No. 1 Ruttley Wiseman, Sec. 2-16s-23e. Drlg. sh. 8,-440 ft.

Geo. Conover's No. 1 Conover Community, Sec. 22-15s-23e. Loc.

Fohs Oil Co.'s No. 1 Conzelman, Sec. 22-15s-23e. Loc.

Bateman Lake—St. Mary Parish

Texas Co.'s No. 3 State, Sec. 16s-12e. 7-in. csg. 10,970 ft.; cg. sh. 11,242 ft.

Texas Co.'s No. 3 Wax Bayou, Sec. 21-16s-12e. 7-in. csg. 10,984 ft.; T.D. 11,-127 ft.; rec. 275 ft. of oil 10,879-10,-900 ft.; D.S. stk.; fsg.

Texas Co.'s No. 4 Wax Bayou, Sec. 21-16s-12e. T.D. 11,007 ft.; 7-in. csg. 11,-003 ft.; P.B. 6,910 ft.; perf. csg. 6,885-6,900 ft.; rec. S.W.; perf. csg. 9,610-31 ft.; gas well.

Baton Rouge—East Baton Rouge Parish

Guaranty Oil Co.'s No. 2 Morgan, Sec. 65-7s-1w. T.D. 6,530 ft.; 5½-in. csg. 6,-450 ft.; swbd. S.W.; cleaning hole with reversing tool.

Wm. Heiis' No. 8 Nelson, Sec. 36-7s-1w. T.D. 6,473 ft.; 7-in. csg. 6,466 ft.; perf csg. 7,201-04 ft.; flwd. gas.

Lisbon Iberia Oil Corp.'s No. 3 University Hills subd., Sec. 68-7s-1w. Drlg. sh. 1,363 ft.

Sugarfield Oil Co.'s No. 2 McDonald Community, Sec. 46-7s-1e. T.D. 7,220 ft.

Bay St. Elaine—Terrebonne Parish

Texas Co.'s No. 3 L.L.&E., Sec. 18-22s-18e. 7-in. csg. 6,000 ft.; drlg. sh. 6,-510 ft.

Bayou Blue—Iberville Parish

T. G. Markley and Crosby Drlg. Co.'s No. 1 Baiste, Sec. 74-9s-10e. Loc.

Superior Oil Co.'s No. 2 Schwing Lbr. & Shingle Co., Sec. 74-9s-10e. Drlg. sh. 6,830 ft.

Bayou Choctaw—Iberville Parish

Standard Oil Co. of La.'s No. 2 Cypress, Sec. 28-8s-11e. 10¾-in. csg. 2,250 ft.; drlg. sdy. sh. 5,180 ft.

Bayou des Glaise—Iberville Parish

Humble O. & R. Co.'s No. 2-B Wilberts, Sec. 78-8s-8e. 10¾-in. csg. 2,854 ft.; drlg. sh. 7,900 ft.

Black Bayou—Cameron Parish

Shell Oil Co., Inc.'s No. 44 Watkins, Sec. 7-12s-12w. S.D. 5,826 ft., salt; abd.

Caillou Island—Terrebonne Parish

Texas Co.'s No. 64 State, Sec. 20-23s-20e. T.D. 5,790 ft., salt; 7-in. csg. 5,682 ft. perf. csg. 5,430-80 ft.

Texas Co.'s No. 65 State, Sec. 17-23s-20e. Drlg. sdy. sh. 5,880 ft.

Cameron Meadows—Cameron Parish

Magnolia Pet. Co.'s No. 27 Cameron Meadows, Sec. 21-14s-13w. Drlg. sh. 2,-500 ft.

Chacahoula—La Fourche Parish

Sun Oil Co.'s No. 1 Cypress, Sec. 75-15s-15e. 13⅜-in. csg. 1,842 ft.; T. salt 6,-072 ft.; T.D. 6,088 ft.; P.B. 2,100 ft.; sdtrkd.; T.D. 6,553 ft.; fsg.; sdtrkd.; T.D. 5,544 ft.; P.B. to sdtrk.; T.D. 7,-271 ft.; sdtrkd.; T.D. 7,426 ft.; P.B. 4,075 ft.; S.D.

Sun Oil Co.'s No. 7 Dibert, Stark & Brown Cypress Co., Sec. 70-15s-15e. Drlg. sh.&L. 6,015 ft.

Chalkley Field—Cameron Parish

Humble O. & R. Co.'s No. 6 Hanzen, Sec. 9-12s-6w. Drlg. sd. 5,776 ft.

Shell Oil Co., Inc.'s No. 6 Hanzen, Sec. 21-12s-6w. T.D. 8,951 ft.; perf. csg. 8,-910-33 ft.; I.P. 880 B.P.D.; ¼-in. ck. well went to S.W.; P.B. 8,940 ft.; fsg.

Shell Oil Co., Inc.'s No. 7-A Hanzen, Sec. 20-12s-6w. R.U.

Union Sulphur Co.'s No. 1 Sweet Lake Ld. Co., Sec. 13-12s-7w. T.D. 9,250 ft.; abd.

Cheneyville—Rapides Parish

S. W. Richardson's No. 10 Well, Sec. 54-1s-2e. T.D. 5,784 ft.; 5½-in. csg. 5,782 ft.

Darrow—Ascension Parish

Humble O. & R. Co.'s No. 28 Community, Sec. 30-10s-2e. T.D. 4,649 ft.; tstg.

Humble O. & R. Co.'s No. 29 Community, Sec. 30-10s-2e. Loc.

Kiva Oil Co.'s No. 1 Dupiessis, Sec. 69-10s-2w. S.D. 2,523 ft.

Dog Lake—Terrebonne Parish

Texas Co.'s No. 11 State, Sec. 32-21s-16e 10¾-in. csg. 1,751 ft.; T.D. 6,818 ft., salt; T. salt 6,807 ft.; P.B.; sdtrkd.; drlg. sh. 6,358 ft.

Edgerly—Calcasieu Parish

Emerson Oil Corp.'s No. 3 Stanolind fee Sec. 28-9s-11w. Drk.

Eola—Avoyelles Parish

Amerada Pet. Corp.'s No. 3 Avoyelles, Sec. 5-2s-3e. Drk.

Amerada Pet. Corp.'s No. 1 Sam Cerami, Sec. 6-2s-3e. Drk.

Amerada Pet. Corp.'s No. 2 Cerami, Sec. 6-2s-3e. Loc.

Amerada Pet. Corp.'s No. 1-A Dent, Sec. 10-2s-2e. Cg. sh. 8,420 ft.
Amerada Pet. Corp.'s No. 3 Dent, Sec. 10-2s-2e. T.D. 8,575 ft.; tstg.
Amerada Pet. Corp.'s No. 3 Irion, Sec. 6-2s-3e. R.U.
Amerada Pet. Corp.'s No. 1 Monchau, Sec. 1-2s-2e. T.D. 8,573 ft.; tstg.
Amerada Pet. Corp.'s No. 4 Whitlow, Sec. 1-2s-2e. Drlg. sh. 6,020 ft.
Hany Bass & Lake's No. 1 Ritchie Grocery, Sec. 3-1s-3e. Loc.
Gulf Oil Corp.'s No. 2 Mouliere, Sec. 1-2s-2e. Drlg. sh. 2,030 ft.
Gulf Oil Corp.'s No. 2 Mouliere, Sec. 1-2s-2e. Loc.
G. R. Kenedy's No. 1 Josie Hudson, Sec. 1-2s-2e. Drlg. sh. 2,630 ft.
Magnolia Pet. Co.'s No. 1 O. Q. Foster, Sec. 6-2s-3e. Drlg. 2,034 ft.
S. W. Richardson's No. 10 Haas Inv. Co., Sec. 7-2s-3e. Cg. 8,570 ft.
Sun Oil Co.'s No. 3 Townsend, Sec. 8-2s-3e. T.D. 8,572 ft.; P.B.; sdtrkd.; T.D. 8,570 ft.; perf. csg. 8,502-70 ft.; I.P. 639 B.P.D.; ¼-in. ck.

Fausse Point—Iberia Parish

Sun Oil Co.'s No. 1 Planters Lbr. Co., Sec. 27-11s-8e. 10¾-in. csg. 1,424 ft.
Texas Co.'s No. 7 State, Sec. 35-11s-8e. R.U.

Garden Island—Plaquemines Parish

Texas Co.'s No. 42 State, Sec. 38-23s-33e. Drlg. sd.&sh. 2,683 ft.
Texas Co.'s No. 43 State, Sec. 38-28s-33e. Drlg. sh. 1,125 ft.

Gibson—Terrebonne Parish

Shell Oil Co., Inc.'s No. 8 Pelican, Sec. 35-17s-15e. Drlg. sh. 8,911 ft.

Gillis—Calcasieu Parish

Fohs Oil Co.'s No. 2-A M. P. Erwin, Sec. 14-9s-8w. Drk.

Golden Meadow—La Fourche Parish

Bateman Drlg. Co.'s No. 1 Harry Louviere, Sec. 9-19s-22e. T.D. 5,560 ft.; 5½-in. csg. 5,260 ft.; perf. csg. 5,150-80 ft.; S.D.
Bennett O. & R. Co.'s No. 3 Authement, Sec. 12-19s-22e. T.D. 2,300 ft.
Bennett O. & R. Co.'s No. 1 Philozate, Sec. 12-19s-22e. T.D. 8,605 ft.; perf. csg. 8,360-8,400 ft.; blew out, flwg. oil and gas.
Berkshire Oil Co.'s No. 1 Malgom, Sec. 2-19s-22e. T.D. 2,670 ft.; 7-in. csg. 2,627 ft.; I.P. 294 B.P.D.; ¼-in. ck.
Brown & Woods' No. 1 S. Hogan, Sec. 9-19s-22e. T.D. 2,710 ft.; P.B. to 1,500 ft.; sdtrkd.; T.D. 2,672 ft.; 7-in. csg. on bttm.; perf. csg. 2,650-65 ft.; would not flow; S.D.
Taylor Fithian's No. 1 Cheramie, Sec. 12-19s-22e. R.U.
Wm. Helis' No. 3 Gaspard, Sec. 9-19s-22e, 6-in. csg. 2,655 ft.; T.D. 2,664 ft.; acd.
M. H. Marr et al's No. 2 B. & D. unit, Sec. 17-19s-22e. Loc.
M. H. Marr et al's No. 4 Adam Terrebonne, Sec. 9-19s-22e. 10¾-in. csg. 670 ft.; T.D. 5,175 ft.
Martex Oil Corp.'s No. 1-C Rebstock Community, Sec. 2-19s-22e. T.D. 5,226 ft.; 7-in. csg. 5,226 ft.; perf. csg. 5,157-82 ft.; I.P. 127 B.P.D.; 12/64-in. ck.
Martex Oil Co.'s No. 3-A Rebstock, Sec. 2-19s-22e. T.D. 2,665 ft.; 5-in. csg. 2,665 ft.; perf. csg. 2,630-62 ft.; would not flow; S.D.
S. Rhodes Drlg. Co.'s No. 4 Falgout Holding, Sec. 9-19s-22e. T.D. 5,210 ft.; 6⅝-in. csg. 5,210 ft.
Fred Shield's No. 1 Lafont, Sec. 2-19s-22e. 10¾-in. csg. 103 ft.; S.D.
Terouche Oil Co.'s No. 2 Cheramie, Sec. 12-19s-22e. Drk.
Texas Co.'s No. 11 Falgout Holding Co., Sec. 9-19s-22e. T.D. 5,175 ft.; 7-in. csg. 5,160 ft.; I.P. 421 B.P.D.; ¼-in. ck.
Texas Co.'s No. 10 Golden Meadow, Sec. 78-19s-21e. 10¾-in. csg. 765 ft.
Texas Co.'s No. 3 La Terre Co., Sec. 1-20s-21e. T.D. 5,673 ft.; sdtrkd.; T.D. 10,472 ft.; rmg.

Grand Bay—Plaquemines Parish

Gulf Oil Corp.'s No. 7-A Grand Prairie Lv. Dist., Sec. 5-20s-19e. Loc.
Gulf Oil Corp.'s No. 8-A Grand Prairie Dist., Sec. 5-20s-19e. Loc.
Gulf Oil Corp.'s No. 4 State QQ, Sec. 5-20s-19e. Drlg. sh. 7,660 ft.
Gulf Oil Corp.'s No. 4 State, Sec. 20-19s-19e. Drlg. sh. 6,520 ft.
Gulf Oil Corp.'s No. 5 State QQ, Sec. 31-19s-19e. Loc.
Texas Co.'s No. 1 State-Lookout Pass, Sec. 48-20s-18e. Loc.
Texas Co.'s No. 2 State-Lookout Pass, Sec. 31-19s-19e. T.D. 10,342 ft.; 7-in. csg. 10,342 ft.; perf. csg. 8,725-70 ft.; I.P. 780 B.P.D.; ¼-in. ck.
Gulf Oil Corp.'s No. 1 State QQ, Sec. 6-20s-19e. Cg. sh. 8,927 ft.

Grand Lake—Cameron Parish

Amerada Pet. Corp.'s No. 4 State, Twp. 13s-4w. R.U.
Amerada Pet. Corp.'s No. 5 State, Twp. 13s-14w. T.D. 9,657 ft.; tstg.
Superior Oil Co.'s No. 8 State-Lake, Twp. 13s-4w. Drlg. sdy. sh. 8,052 ft.

Hackberry—Cameron Parish

Harrison & Abercrombie's No. 1 Doiron, Sec. 37-12s-10w. 10¾-in. csg. 1,441 ft.; cg. sh. 7,280 ft.
Stanolind O. & G. Co.'s No. 21-A Cameron Sch. Bd., Sec. 16-12s-10w. Drlg. sh.&L. 9,190 ft.
Stanolind O. & G. Co.'s No. 31 Gulf Ld., Sec. 25-12s-11w. Loc.
Superior Oil Co.'s No. 9 Benson Vincent, Sec. 30-12s-10w. 9⅝-in. csg. 950 ft.; drlg. sh. 6,300 ft.
Texas Co.'s No. 17-B State, Twp. 12s-9w. T.D. 6,850 ft.; 5-in. csg. 6,780 ft.; perf. csg. 6,690-6,737 ft.; W.O.S.R.
Texas Co.'s No. 29-B State, Twp. 12s-9w. Cg. sh. 8,341 ft.

Happytown—Iberville Parish

Shell Oil Co., Inc.'s No. 1 Schwing Lbr. & Shingle Co., Sec. 85-7s-8e. T.D. 7,643 ft.; D.S. stk.

Horseshoe Bayou—St. Mary Parish

Texas Co.'s No. 4 State, Sec. 23-17s-9e. Drlg. sh. 1,736 ft.

Jeanerette—St. Mary Parish

Herton Oil Co.'s No. 5 Roane, Sec. 38-13s-9e. T.D. 10,789 ft.; 7⅝-in. csg. 10,260 ft.; P.B. 6,675 ft.; perf. csg. 6,635-43 ft.; I.P. 324 B.P.D.; 7/32-in. ck.

Jefferson Island—Iberia Parish

Texas Co.'s No. 4 Jefferson Island Salt, Sec. 58-12s-5e. 7⅝-in. csg. 8,494 ft.; T.D. 8,646 ft.; fsg.
Texas Co.'s No. 3 State, Twp. 12s-5e. T.D. 6,860 ft.; run electrical survey.

Jennings—Acadia Parish

Brown & Sisson's No. 1 Arnaudet, Sec. 47-9s-2w. Drlg. sdy. sh. 1,805 ft.
Glassell-Glassell's No. 8 McFarlain, Sec. 41-9s-2w. Drk.
Glassell-Glassell's No. 8 Trusher, Sec. 47-9s-2w. T.D. 9,165 ft.; sdtrkd.; 7-in. csg. 8,750 ft.; T. salt 10,735 ft.; T.D. 10,766 ft.; perf. csg. 8,638-43 ft.; rec. oil and S.W.; retstg.
Gulf Oil Corp.'s No. 42 Arnaudet, Sec. 47-9s-2w. 7-in. csg. 7,961 ft.; T.D. 7,983 ft.; pulled tbg. in two; fsg.
Shell Oil Co., Inc.'s No. 10 Community, Sec. 40. Drlg. sh.&sd. 1,927 ft.
Stanolind O. & G. Co.'s No. 117 Crowley O. & Min. Co., Sec. 48-9s-2w. Drlg. sd. &L. 4,648 ft.
Stricker-Pharis et al's No. 1 Gulf fee, Sec. 45-9s-2w. 16-in. csg. 60 ft.; drlg. sd.&sh. 7,033 ft.

Lafitte—Jefferson Parish

Texas Co.'s No. 15 Lafitte, Sec. 20-17s-24e. T.D. 10,135 ft.; 7-in. csg. 10,123 ft.; perf. csg. 9,940-70 ft.; tstg.
Texas Co.'s No. 16 L.L.&E., Lafitte, Sec. 17-17s-24e. Loc.
Texas Co.'s No. 6-A Madison Realty Co., Sec. 17-17s-24e. Dredge canal.
Texas Co.'s No. 13 Rigolet Cooperative Fur Co., Sec. 29-17s-24e. Drlg. sh. 3,630 ft.
Texas Co.'s No. 3 State, Bayou Norman, Sec. 21-17s-24e. Drlg. sh. 9,810 ft.

La Fourche Crossing—La Fourche Parish

Mikton Oil Co.'s No. 2 Martinez, Sec. 132-15s-17e. 11¾-in. csg. 2,687 ft.; T.D. 4,904 ft.; P.B. 4,700 ft.; T.D. 10,998 ft.; 5½-in. csg. 10,042 ft.; perf. csg. 10,018-24 ft.; flwd. gas and dist.; flow lines froze; sqzd. perf.; retstg.

Lake Hermitage—Plaquemines Parish

Gulf Oil Corp.'s No. 11 La Fourche Basin Lv. Dist., Sec. 11-18s-25e. P.B. 1,395 ft.; sdtrkd.; drlg. sdy. sh. 3,732 ft.

Lake Mongoulois—St. Martin Parish

Texas Co.'s No. 8 State, Sec. 10-10s-9e. Drk.

Lake Pelto—Terrebonne Parish

Texas Co.'s No. 30 Lake Pelto, Sec. 7-23s-18e. T.D. 5,271 ft., salt; sdtrkd.; T. salt 5,243 ft.; P.B. 3,119 ft.; drlg. wtr. sd. 5,180 ft.

La Place—St. James Parish

Pan American Prod. Co.'s No. 1 Godchaux Sugars, Sec. 97-11s-7e. 10¾-in. csg. 2,814 ft.; drlg. brkn. L. 7,198 ft.

New Iberia—Iberia Parish

Acadian Prod. Co.'s No. 4 E. T. Weeks, Sec. 51-12s-7e. Loc.
Canal Oil Co.'s No. 3 Bernard, Sec. 54-12s-7e. T.D. 4,653 ft.; 7-in. csg. 4,436 ft.; fsg.
Wm. Helis' No. 12 Bolivar, Sec. 56-12s-7e. T.D. 1,204 ft.; 7-in. csg. 1,002 ft.
Wm. Helis' No. 1-A Bullock, Sec. 25-12s-7e. Drlg. sdy. sh. 3,358 ft.
Wm. Helis' No. 9 Schwing, Sec. 56-12s-7e. T.D. 855 ft.; 7-in. csg. 825 ft.; W. O.S.R.
Wm. Helis' No. 10 Schwing, Sec. 56-12s-7e. Drlg. sdy. sh. 5,659 ft.
Texas Co.'s No. 2 Bryant, Sec. 25-12s-7e. R.U.
Texas Co.'s No. 7 Bryant, Sec. 25-12s-7e Drk.
Texas Co.'s No. 15 Duke, Sec. 26-12s-7e. T.D. 4,282 ft., salt; 7-in. csg. 4,272 ft.
Texas Co.'s No. 2 Hebert, Sec. 25-12s-7e. T.D. 1,935 ft.; 10¾-in. csg. 1,935 ft.; drlg. sh.&L. 5,750 ft.
Texas Co.'s No. 1 H. Perry Walet, Sec. 2-12s-7e. T.D. 9,116 ft.; 7-in. csg. 8,838 ft.; perf. csg. 7,888-7,900 ft.; W. S.R.
Texas Co.'s No. 2 Smith, Sec. 71-12s-7e. Drlg. sdy. sh. 8,190 ft.

North Crowley—Acadia Parish

Humble O. & R. Co.'s No. 1 Reiners Sec. 45-8s-1e. T.D. 8,991 ft.; 7-in. csg 8,990 ft.
Humble O. & R. Co.'s No. 7 Williams, Sec. 33-8s-1e. T.D. 8,813 ft.; 7-in. csg. 8,811 ft.; tstg.

Paradis—St. Charles Parish

Jolly Pet. Co.'s No. 1 Matthews Oliveira, Sec. 4-14s-20e. Drlg. sh. 5,210 ft.
Texas Co.'s No. 3 L.L.&E., Paradis, Sec 8-14s-20e. 10¾-in. csg. 1,448 ft.; T.D. 10,490 ft.; 7-in. csg. on bttm.; cd. O.S. 10,188-10,256 ft.; drlg. sh. 11,567 ft.
Texas Co.'s No. 1 Sunset Realty & Planting Co., Sec. 38-14s-20e. Bldg. rd.

Plumb Bob—St. Martin Parish

Texas Co.'s No. 13 St. Martin Ld. Co., Sec. 21-8s-7e. Drlg. sd. 7,068 ft.

Port Barre—St. Landry Parish

McDannald Oil Co.'s No. 2 Futral, Sec. 20-6s-5e. T.D. 5,514 ft.; sdtrkd.; cg. 5,546 ft.
McDannald Oil Co.'s No. 1 Sibille, Sec. 7-6s-6e. Bldg. rd.
McDannald Oil Co.'s No. 2 Sibille, Sec. 7-6s-6e. Loc.
Y. D. Spill's No. 1 Gaudet, Sec. 4-6s-5e. S.D. 4,700 ft.
Texas Co.'s No. 27 Botney Bay, Sec. 4-6s-5e. T.D. 6,239 ft.; 7-in. csg. 6,236 ft.; tstg.
Westgate-Greenland Oil Co.'s No. 1 Jeansenne, Sec. 20-6s-5e. 7-in. csg. 5,286 ft.; perf. csg.; T.D. 5,314 ft.; S.D.

Potash—Plaquemines Parish

Humble O. & R. Co.'s No. 42 Orleans Lv. Dist., Sec. 14-18s-15e. Drlg. sh. 4,860 ft.

Quarantine Bay—Plaquemines Parish

Gulf Oil Corp.'s No. 6-A Orleans Lv. Bd., Sec. 7-19s-17e. Driving piling.
Gulf Oil Corp.'s No. 12 State, Sec. 18-19s-17e. Drlg. sh. 8,510 ft.
Gulf Oil Corp.'s No. 16 State, Sec. 7-19s-17e. 13⅜-in. csg. 1,598 ft.; drlg. sh. 5,212 ft.

Raceland—La Fourche Parish

Amerada Pet. Corp.'s No. 5 South Coast Corp., Sec. 34-15s-19e. Drlg. sh.&L. 4,800 ft.

Sorrento—Ascension Parish

Sorrento Synd.'s No. 2 L. L. Bernard, Sec. 22-10s-4e. R.U.

South Jennings—Jeff Davis Parish

Stanolind O. & G. Co.'s No. 1 Clare E. Landry and A. A. Hebert. T.D. 9,638 ft.; 5½-in. csg. 9,487 ft.; perf. csg. 8,895-8,905 ft.; fsg. for tbg.
Stanolind O. & G. Co.'s No. 1 Morgan, Sec. 15-10s-3w. Drlg. sh. 9,410 ft.
Stanolind O. & G. Co.'s No. 1 L. Remage, Sec. 9-10s-3w. Drlg. sdy. sh. 9,067 ft.

Starks—Calcasieu Parish

W. T. Burton & McLean's No. 2 Industrial Lbr. Co., Sec. 29-9s-12w. Loc.

Sweet Lake—Cameron Parish

Pure Oil Co.'s No. 15 Yount-Lee, Sec. 12-13s-8w. Drlg. sdy. L. 7,530 ft.

Valentine—La Fourche Parish

Wm. Helis' No. 6 Valentine Sugars, Inc., Sec. 2-17s-20e. Drlg. sh. 3,450 ft.

Venice—Plaquemines Parish

Tide Water Asso. Oil Co.'s No. 7 Buras Lv. Bd., Sec. 22-21s-30e. 16-in. csg. 205 ft.; drlg. sh. 6,943 ft.

Vermilion Bay—Iberia Parish

Texas Co.'s No. 4-B Vermilion Bay, Twp. 16s-15e. 11¾-in. csg. 4,454 ft.; T. salt 5,855 ft.; base sale 7,435 ft.; run csg.

Villa Platte—Evangeline Parish

Amerada Pet. Corp.'s No. 1 Leona O. Roberie, Sec. 1-4s-2e. Drlg. sh. 7,490 ft.
Continental Oil Co.'s No. 3 Coreil, Sec. 36-3s-2e. T.D. 9,140 ft.; fsg.
Continental Oil Co.'s No. 2 B. G. Fontenot, Sec. 41-4s-2e. Drlg. sh. 8,850 ft.
Continental Oil Co.'s No. 6 Fontenot, Sec. 41-4s-2e. Drlg. sh. 8,210 ft.
Continental Oil Co.'s No. 5 Haas, Sec. 44-3s-2e. Drlg. sh. 5,930 ft.
Continental Oil Co.'s No. 5 Oscar Pitre, Sec. 40-4s-2e. T.D. 9,040 ft.; I.P. 257 B.P.D.; ⅛-in. ck.
Continental Oil Co.'s No. 1 Adam Tate, Sec. 41-4s-2e. Drlg. sh. 6,030 ft.
Continental Oil Co.'s No. 1 David Tate, Sec. 36-3s-2e. Drlg. sh. 10,220 ft.
Continental Oil Co.'s No. 1 J. E. Vidrine, Sec. 1-4s-2e. T.D. 5,637 ft.; fsg.
Danciger O. & R. Co.'s No. 2 J. E. Vidrine, Sec. 1-4s-2e. Drlg. sh. 1,500 ft.

West Gueydan—Vermilion Parish

Magnolia Pet. Co.'s No. 1 J. Hartwell, Sec. 5-12s-2w. Drk.

West Lake Verret—St. Mary Parish

Shell Oil Co., Inc.'s No. 4 Jeanerette. 7⅝-in. csg. 10,683 ft.; T.D. 11,890 ft.; D.S. stk.

White Castle—Iberville Parish

Jolly Pet. Corp.'s No. 1 E. B. Adams, Sec. 1-11s-12e. Drlg. 105 ft.
Shell Oil Co., Inc.'s No. 1 Forest Home. Cg. sd. 6,411 ft.
Shell Oil Co., Inc.'s No. 16 Wilbert, Sec 8-11s-12e. Loc.

Woodlawn—Jeff Davis Parish

Union Sulphur Co.'s No. 1 T. Miller, Sec. 6-9s-5w. R.U.
Union Sulphur Co.'s No. 2 Norton, Sec. 12-9s-6w. T.D. 8,127 ft.; 7-in. csg. 8,127 ft.; perf. csg. 8,090-95 ft.; I.P. 288 B.P.D.; 10/64-in. ck.
Union Sulphur Co.'s No. 1 Trimble, Sec. 7-9s-5w. T.D. 9,515 ft.; 5-in. csg. 9,515 ft.; perf. csg. 8,090-95 ft.; I.P. 292 B. P.D.; 16/64-in. ck.
Woodlawn Oil Corp.'s No. 1 Hebert, Sec. 1-9s-6w. T.D. 9,543 ft.; 7-in. csg. 9,176 ft.; perf. csg. 9,189-93 ft.; flwd. S.W. and dist.; well flwd. 100% S.W.; plld. tbg.; set cmt. retainer at 9,175 ft; sqzd. perf.; reperf. csg. 8,139-42 ft.; flwg. 16 bbl. dist. per day; ⅝-in. ck.; killed; perf. csg. 8,140-43 ft.

S. LOUISIANA WILDCATS

Acadia Parish

Humble O. & R. Co.'s No. 1 Leger, Sec. 83-8s-2e. Drk.
Vincent, Welch & E. J. Nicklos' No. 1 L. Ruppert, Sec. 21-7s-1w. Cg. sdy. sh. 8,340 ft.

Assumption Parish

Falcon-Seaboard Drlg. Co.'s No. 1 Alex Simoneaux, Sec. 43-12s-13e. 18⅝-in. csg. 60 ft.; T.D. 1,905 ft.; run 11¾-in. csg.; drlg. sh. 3,193 ft.

Beauregard Parish

Atlantic Ref. Co.'s No. 1 Lutcher Moore Lbr. Co., Sec. 13-5s-12w. S.D. 10,501 ft.; W.O.
Atlantic Ref. Co.'s No. 1 Lutcher Moore, Sec. 22-3s-11w. Loc.
Atlantic Ref. Co.'s No. 1 Rice Ld. & Lbr. Co., Sec. 22-3s-11w. Loc.
Atlantic Ref. Co.'s No. 1 D. A. Whitmer, Sec. 26-3s-11w. 10¾-in. csg. 2,037 ft.; T. Cockfield sd. 5,684 ft.; cg. sdy. sh. 8,575 ft.
Loffland Bros.' No. 3 Long Bell Lbr. Co., Sec. 24-5s-11w. Drlg. sh. 1,639 ft.

Calcasieu Parish

Edson Pet. Co.'s No. 1 Edgwood Ld. & Logging Co., Sec. 33-7s-10w. R.U.

Cameron Parish

Phillips Pet. Co.'s No. 1 Miami Corp., Sec. 11-4s-6w. T.D. 10,195 ft.; well tried to blow out; stk. D.S.; sdtrkd. 3,775 ft.; drlg. sh. 4,365 ft.
Superior Oil Co.'s No. 1 State, Calcasieu Lake, Twp. 14s-9w. Drlg. anhy. 2,003 ft.

East Baton Rouge Parish

Farris & Golding Drlg. Co.'s No. 1 Paulet, Sec. 58-8s-1e. R.U.

Iberia Parish

Plymouth Oil Co. et al's No. 1 Lynch McHugh, Sec. 13-12s-10e. 10¾-in. csg 2,519 ft.; T.D. 10,021 ft.; 7-in. csg. 8,268 ft.; perf. csg. 8,158-86 ft.; rec. 20 bbl. S.W.; sqzd. perf.; W.O.C.

Iberville Parish

Shell Oil Co., Inc.'s No. 1 Southwood, Sec. 20-9s-2e. Drlg. sd. 331 ft.

Jeff Davis Parish

Continental Oil Co.'s No. 1 Niblett, Sec. 1-11s-5w. 13⅜-in. csg. 2,085 ft.; T.D. 11,619 ft.; 7-in. csg. 10,955 ft.
H. M. Naylor's No. 1 Acadia Dev. Co., Sec. 12-10s-2w. T.D. 2,190 ft.; run 10¾-in. csg.
Union Sulphur Co.'s No. 1 Somson, Sec. 35-7s-4w. Drlg. sh. 7,317 ft.

Jefferson Parish

Vendome Pet. Co.'s No. 1 Coulon, Sec. 15-15s-23e. Drk.

La Fourche Parish

Ernest Cockrell's No. 1 La Fourche Ld. Co., Sec. 32-18s-22e. R.U.
Gulf Oil Corp.'s No. 1-B Bowie Lbr. Co., Sec. 69-15s-19e. Drlg. sh. 2,130 ft.
Humble O. & R. Co.'s No. 1 Caldwell Sugars, Inc., Sec. 115-14s-15e. 13⅜-in. csg. 2,988 ft.; drlg. sh. 8,210 ft.
Tide Water Asso. Oil Co.'s No. 1 Delta Farms, Inc., Sec. 6-17-23e. T.D. 11,850 ft.; P.B. T.D. 11,810 ft.; perf. csg. 11,780-11,800 ft.; rec. 30 ft. of dist., 400 ft. drlg. mud; P.B. 11,325 ft.; perf. csg. 11,290-11,305 ft.; rec. S.W.; perf. csg. 11,270-80 ft.; 85 stands oil and S.W.; perf. csg. 8,908-18 ft.; rec. 2 jts. dist.; sqzd. perf.; perf. csg. 8,917-22 ft.; 30-min. D.S.T., 2,800 lb. W.P.; rec. 4 jts. dist.; sqzd.; perf. csg. 8,750-60 ft.; 26-min. D.S.T. tstd. 2,200 lb. W.P.; made sqz. job; drill out cmt. to 11,280 ft.; prep. to perf. csg.; made sqze. job 11,270-11,305 ft.; perf. csg. 11,310-18 ft.; flwd. 33 bbl. 30-grv. oil per hr.; ¼-in. ck.; rec. 150 ft. S.W.; make sqze. job.

Livingston Parish

Roderick Tower, Inc.'s No. 1 James Pirie, Sec. 41-7s-3e. Drlg. sh. 6,736 ft.

Orleans Parish

W. T. Burton's No. 1 L.&N.R.R., Sec. 18 11s-15e. T.D. 10,405 ft.; P.B. 10,150 ft.
W. T. Burton's No. 2 State, Lake Pontchartrain, Twp. 10s-13e. Drlg. sh. 9,175 ft.

Plaquemines Parish

California Co.'s No. 1 Delta Minerals, Sec. 2-15s-24e. 13⅜-in. csg. 2,028 ft.; drlg. sh. 8,630 ft.
Gulf Oil Corp.'s No. 1-D Buras Lv. Dist. Sec. 6-23s-3e. 9⅝-in. csg. 8,204 ft.; 7-in. csg. 10,103 ft.; T.D. 10,138 ft.; well flwd. S.W.; S.D.

Rapides Parish

Smith & Aarnes' No. 1 Eota Realty Co., Sec. 12-4n-3e. Drk.; abd.

St. Charles Parish

R. H. Parker et al's No. 1 C. L. Thompson, Sec. 87-13s-20e. 10¾-in. csg. 2,599 ft.; drlg. sh. 8,537 ft.

St. James Parish

St. James Oil Co.'s No. 1 Celstine Plant, Sec. 74-11s-4e. R.U.

St. Bernard Parish

Gulf Ref. Co.'s No. 4 State-R.R. (Lake Borgne), Twp. 12s-15e. 9⅝-in. csg. 8,161 ft.; T.D. 10,632 ft.; P.B. 9,700 ft.; rmd. to 9,658 ft.; loss core bbl.; P.B.

sdtrkd. 8,912 ft.; T.D. 10,528 ft.; 7-in. csg. 10,494 ft.; drlg. sdy. sh. 11,543 ft.

St. Martin Parish

Wm. Helis' No. 1 Rycade Oil Co., Sec. 33-9s-7e. T.D. 8,899 ft.; sdtrkd. 7,303 ft.; T.D. 9,411 ft.; abd.

St. Mary Parish

Perry S. Cooney's No. 1 A. W. Allain, Sec. 46-13s-9e. S.D. 2,600 ft.

Joe Domingue's No. 1 Allain, Sec. 46-13s-9e. Drlg. sh. 1,610 ft.

Texas Co.'s No. 1 State. Cote Blanche Twp. 16s-7e. Cd. sdy. sh. S.S.O. 7,334-87 ft.; T.D. 8,685 ft.; cmtd. csg. to test sd. 3,109-61 ft.

Terrebonne Parish

Barnsdall Oil Co.'s No. 1 Nelson, Sec. 2-21s-11e. 10¾-in. csg. 2,767 ft.; 8⅝-in. csg. 10,505 ft.; T.D. 11,288 ft.; sdtrkd.; T.D. 10,917 ft.; P.B. 10,472 ft.

Texas Co.'s No. 4 State, Coon Point, in Lake Caillou, Twp. 23s-14e. Drlg. sdy. sh. 7,367 ft.

Vermillion Parish

La. Ld. & Explrtn. Co.'s No. 1 Walter White hrs., Sec. 17-15s-1e. 13⅜-in. csg. 2,800 ft.; drlg. sh. 2,813 ft.

Texas Co.'s No. 1 Vermilion Par. Sch. Bd., Sec. 16-13s-4e. T.D. 9,923 ft.; 7⅝-in. csg. 9,918 ft.; T.D. 10,595 ft.; P.B. 10,250 ft.; sdtrkd. 10,300 ft.; cd. S.W. sd. 10,659-79 ft.; T.D. 11,762 ft.; fsg. for sidewall sampler.

G. H. Vaughn's No. 1 Avery Boullion, Sec. 49-13s-4e. Drlg. sh. 1,800 ft.

TEXAS

Week Ended March 16

GULF COAST FIELDS

Anchor—Brazoria County

Humble O. & R. Co.'s No. 1 R. H. Carr, Blk. 62. 9⅝-in. csg. 6,950 ft.; cg. sd. &sh. 10,680 ft.

Humble O. & R. Co.'s No. 1 Crockett, J. de Jesus Valderas Sur. 13⅜-in. csg.; drlg. sh. 10,360 ft.

Humble O. & R. Co.'s No. 1 Galznick & Taylor, J. de Jesus Valderas Sur. 9⅝-in. csg. 6,953 ft.; T.D. 10,994 ft.; 7-in. csg. 10,822 ft.; prep. to test.

Humble O. & R. Co.'s No. 1 Heim & Holland. S. Marsh Sur. Loc.

Glenn McCarthy's No. 1 Galznick, Valderas Sur. T.D. 10,495 ft.; perf. csg. 10,480-85 ft.; flwg. est. 22 B.P.H.; ¼-in. ck.

Glenn McCarthy's No. 1 Neidringhaus, J. Bradley Sur. 13⅜-in. csg. 926 ft.; T.D. 9,996 ft.; fsg.

Glenn McCarthy's No. 1 Kate and Laura Yocum, J. D. Valderas Sur. Drlg. 3,-840 ft.

Sun Oil Co.'s No. 1 Morris Stern, Shubal Marsh Sur. 18⅝-in. csg. 128 ft.; drlg. sh.*6,030 ft.

Old Ocean—Brazoria County

Harrison & Abercrombie's No. 8 Armstrong, Polly & Chance Sur. Drlg. sd. &sh. 10,105 ft.

Harrison & Abercrombie's No. 7 Bernard River Ld. Dev. Co., C. Breen Sur. T.D. 10,525 ft.; tstg.

Harrison & Abercrombie's No. 3 Larsen. Breen Sur. T.D. 10,535 ft.; tstg.

Stanolind O. & G. Co.'s No. 1 Hughes, C. Breen Sur. Drlg. sd. 4,337 ft.

Sun Oil Co.'s No. 4 Borsodi, C. Breen Sur. 13⅜-in. csg. 1,520 ft.; drlg. sh.& L. 4,320 ft.

Sun Oil Co.'s No. 4 McCampbell, C. Breen Sur. 13⅜-in. csg. 1,505 ft.; 9⅝-in. csg. 7,010 ft.; T.D. 10,525 ft.; 7-in. csg. 10,-525 ft.

Seabreeze—Chambers County

Sun Oil Co.'s No. 1 Felix Jackson, A. Y. Barbo Sur. Drk.

Sun Oil Co.'s No. 1 Samuelson & Whitney, T.&N.O. Sur. 131. Cored sd., oil odor 8,417-18 ft. and 8,422-23 ft.; T.D. 8,469 ft.; 7-in. csg. 8,469 ft.; perf. csg. 8,396-8,414 ft. and 8,423-28 ft.; flwd. dist.; killed to rework.

Big Creek—Fort Bend County

Merrimac Oil Corp.'s No. 1 George, B. Wickson Sur. (SW flank). Spd. and S.D.

Rosenberg—Fort Bend County

Humble O. & R. Co.'s No. 1 R. Kroesche, H.&T.C. Sur. Drk.

Humble O. & R. Co.'s No. 1 Miller, C. N. Simpson Sur. T.D. 8,499 ft.; 7-in. csg. 8,327 ft.; perf. csg. 8,252-65 ft.; swbg.

Caplen—Galveston County

Sun Oil Co.'s No. 2-26 State, S. F. Hughes Sur. Loc.

Sun Oil Co.'s No. 3 Zinn-Forman Sur. 13⅜-in. csg. 100 ft.; T.D. 7,850 ft.; run csg.

League City—Galveston County

Phillips Pet. Co.'s No. 7 Lobit, Perry & Austin Sur. Drlg. sh. 2,130 ft.

Phillips Pet. Co.'s No. 1 Dr. O. Patton (1 mi. E of production). Perf. csg. 9,177-97 ft.; flwd. S.W.; sqzd. perf.; C.O.

Phillips Pet. Co.'s No. 4 Stewart Title Guaranty Co., S. F. Austin Sur. 10¾-in. csg. 3,520 ft.; 7⅝-in. csg. 9,510 ft.; T.D. 11,270 ft.; well blew out; killed; fsg.

Clear Lake—Harris County

Humble O. & R. Co.'s No. 28-C West. Wm. Doble Sur. T.D. 5,846 ft.; pulling tbg.

Friendswood—Harris County

Humble O. & R. Co.'s No. 2 Pendarvis, T. Choate Sur. T.D. 6,095 ft.

Fannett—Jefferson County

Gulf Oil Corp.'s No. 3 Bordages, J. Probarth Sur. Drlg. sd. 8,142 ft.

Lovells Lake—Jefferson County

Humble O. & R. Co.'s No. 10 Jefferson Ld. Co., C. Hillebrandt Sur. Drlg. L. 6,930 ft.

Humble O. & R. Co.'s No. 1 Oswald, M. Peviot Sur. Drlg. sh. 5,430 ft.

North Cheek—Jefferson County

Strake Pet., Inc.'s No. 1 J. H. Phelan, S. Stivers Sur. Drlg. 6,730 ft.

Strake Pet., Inc.'s No. 1 Pipkin, H.T. &B. Sur. 15. R.U.

South China—Jefferson County

J. K. Hughes Oil Co.'s No. 1-C Guiterman, C. T. Taylor Sur. 12. Drlg. 7,320 ft.

Titanic Oil Co.'s No. 2-B Broussard, S. Miles Sur. T.D. 7,879 ft.; 5½-in. csg. 7,879 ft.; perf. csg. 7,870-79 ft.; tstg.

Titanic Oil Co.'s No. 2-B Guiterman, C. T. Taylor Sur. 12. 10¾-in. csg. 955 ft. T.D. 7,555 ft.; 5½-in. csg. on bttm.; perf. csg. 7,535-39 ft.; tstg.

Esperson—Liberty County

General Crude Oil Co.'s No. 9 Davis, D. Kokernot Sur. T.D. 8,314 ft.; well blew out, caught fire, cratered.

General Crude Oil Co.'s No. 20 Davis, A. McNeil Sur. Drlg. sh. 7,167 ft.

General Crude Oil Co.'s No. 11-B Esperson. Drlg. sh. 7,720 ft.

Martha—Liberty County

Stanolind O. & G. Co.'s No. 1 Garrow, I.&G.N.R.R. Sur. 7. Loc.

Wilson Creek—Matagorda County

Barnsdall Oil Co.'s No. 1 Stoddard, G. B. M. Cotton Sur. R.U.

Segno—Polk County

Gulf Oil Corp.'s No. 4 Quinn, A. Morales Sur. R.U.

Gulf Oil Corp.'s No. 31 Wing, I.&G.N. Sur. 13. Drlg. sh.&L. 7,280 ft.

Gulf Oil Corp.'s No. 32 Wing, I.&G.N. Sur. 14. Drlg. sh. 3,430 ft.

Humble O. & R. Co.'s No. 21-B Kirby Lbr. Co., H. Jackson Sur. Drlg. sh. 5,-050 ft.

Humble O. & R. Co.'s No. 21-BX Kirby Lbr. Co., H. Jackson Sur. R.U.

Spurger—Tyler County

Republic Prod. Co.'s No. 34 fee, N. Hurd Sur. Drlg. sh. 5,706 ft.

Republic Prod. Co.'s No. 1 fee, A. Sterne Sur. Loc.

Republic Prod. Co.'s No. 35 Wing, I.& G.N. Sur. 15. R.U.

Hilje—Wharton County

Texas Co.'s No. 2 Peters, E.T.R.R. Sur.. Sec. 101. Loc.

GULF COAST WILDCATS

Brazoria County

Glenn McCarthy's No. 1 E. W. K. Andrau, H.T.&B. Sur. 5. 10¾-in. csg. 3,-512 ft.; drlg. sd.&sh. 11,432 ft.

Glenn McCarthy's No. 2 Houston Farm Dev. Co., J. Perry & E. Austin Sur. 7. 10¾-in. csg. 3,492 ft.; drlg. sh.&sd. 11,306 ft.

Glenn McCarthy's No. 1 W. B. Munson, Samuel Carter Sur. R.U.

McDannald Oil Co.'s No. 1 S. A. Hatfield, R. B. Lytle Sur. 4, Lot 51. T.D. 7,700 ft.; abd.

Phillips Pet. Co.'s No. 1 McIlvaine, A.C. H.&B. Sur., Sec. 27. Loc.

Titanic Oil Co.'s No. 2 S. E. Allen, J. G. and W. McNeil Sur. R.U.

Titanic Oil Co.'s No. 1 T. J. Poole, T.&W. Alley Lge. T. salt 1,900 ft.; T.D. 4,-396 ft.; abd.

Chambers County

Geo. Anderson et al's No. 1 Veruna Lawrence, W. D. Smith Sur. T.D. 7,-215 ft.; S.W. sd.; 5½-in. csg. 7,215 ft.; perf. csg. 7,126-35 ft.; retstd.; rec. S.W. abd.

Sun Oil Co.'s No. 1 Clara C. Smith, T.& N.O. Sur. 82. Drk.

Colorado County

Cockburn Oil Corp. No. 1 R. W. Ferrs, H. Chrisman Sur. Loc.

Shell Oil Co., Inc.'s No. 1 Plow Realty Co., Obediah K. Winn Sur. Loc.

Fayette County

F. J. Hynes et al's No. 1 A. B. Kerr, J. Parrott Sur. Loc.

Fort Bend County

H. C. Cockburn's No. 1 G. W. Burkett, Bundieck Sur. Loc.

Temple Hargrove et al's No. 1 Sugar Ld. Ind., A. Alcorn Sur. S.D. 2,900 ft.

Galveston County

Continental Oil Co.'s No. 1 Stewart Title Guaranty Co., Perry & Austin Sur. R.U.

Standard Oil Co.'s No. 1 State, Sec. 234, 10¾-in. csg. 2,001 ft.; T.D. 7,134 ft.; sdtrkd.; drlg. sh. 7,430 ft.

Standard Oil Co. of Texas' No. 61-54 State. Loc.

Sun Oil Co.'s No. 1 State, Sec. 178, 13⅜-in. csg. 2,032 ft.; drlg. sh. 7,230 ft.

Grimes County

L. J. Sessions et al's No. 1 J. T. Barry, S. Fuelton Sur. Loc.

Harris County

Gulf Oil Corp.'s No. 1 H. H. Roberts, A. Roberts Sur. T.D. 7,583 ft., S.D.

N. W. Hunter et al's No. 1 Green's Bayou Homesites, S. C. Hiroms Sur. 10¾-in. csg. 810 ft.; S.D. 4,350 ft.

Richard Rodgers et al's No. 1 B. G. Daugherty, W.C.R.R. Sur. T.D. 7,005 ft.

Rowan & Nichols' No. 1 Lobit, B. Barrows Sur. Loc.

Jasper County

Midwest Co.'s No. 1 W. B. Boykin, M. Rack Sur. Loc.

Jefferson County

Fidelity O. & Roy. Co.'s No. 1 J. J. Craigen, J. E. Broussard Sur. T.D. 9,411 ft.; abd.

Hebert & Smith's No. 1 W. S. Clubb, J. L. Lawhorn Sur. R.U.

Merrimac Oil Corp.'s No. 1 State, Tr. 72, 50 ft. due E of Harwell's abd. hole. W.O.; R.U.

Liberty County

Gulf Oil Corp.'s No. 1 Kirby Lbr. Co., Hugh Means Sur. Drlg. sh. 1,520 ft.

Hebert & Smith's No. 1 W. E. Boyt, H. &T.C.R.R. Sur. T.D. 8,834 ft.; cleaned hole to 8,096 ft.; sdtrkd. 7,824 ft.; T.D. 8,700 ft.; 7-in. csg. on bttm.

Matagorda County

Stanolind O. & G. Co.'s No. 1 General American Life Ins., J. C. Peyton Sur. Drlg. sh.&L. 5,520 ft.

Texas Gulf Prod. Co.'s No. 1 Gulf Tex. Oil Co., Ira Ingram Sur. Drk.

Texas Co.'s No. 1 Taylor, Freeman George Sur. Drlg. 1,250 ft.

Van M. Vincent's No. 1 J. F. McNabb Est., E. R. Wightman Lge. Loc.

Montgomery County

H. C. Cockburn et al's No. 1 Bender, Montgomery Co. Sch. Ld. and De Crow Sur. Loc.

Continental Oil Co.'s No. 1 Bender est., Montgomery Co. Sch. Ld. Sur. 13⅜-in. csg. 1,243 ft.; T.D. 8,886 ft.; fsg.

David B. MacDaniel's No. 1 Hattie O. Baldwin, Walker Co. Sch. Ld. Sur. 10¾-in. csg. 1,230 ft.; T.D. 8,900 ft., est.; D.S. stk.

West Conroe Oil Corp.'s No. 1 R. L. Caifee, H. N. McDillon Sur. S.D. 5,017 ft.; tstd. S.W. 4,516-78 ft.

San Jacinto County

Shell Oil Co., Inc.'s No. 1 Santa Fe Tie & Lbr. Co., J. Rankin Sur. Loc.

Tyler County

J. C. Bonham's No. 1 Southwestern Lbr. Co., F. Smyth Sur. T.D. 1,340 ft.; P.B. 1,126 ft.; W.O. csg.

J. Z. Werby's No. 1 Hayes, J. C. Boyett Sur. Drlg. sh. 5,075 ft.

Washington County

J. A. Deering's No. 1 C. W. Bohne, S. Gates Sur. Drlg. sh. 4,810 ft.

Mount Selman Oil Co.'s No. 1 Fritz Fuelberg, W. Lightfoot Sur. Drlg. sh. 5,248 ft.

Wharton County

Cockburn Oil Corp.'s No. 1 Leverage, Jonathan Scott Sur. Drlg. sh. 2,147 ft.

O. C. Garvey's No. 1 T. N. Menefee, S. P. Middleton Sur. Drlg. sh. 265 ft.

Mackhank Oil Co.'s No. 1 F. W. Wilson, E.T.R.R. Sur. 101. T.D. 5,232 ft.; W. O.C.

Magnolia Pet. Co.'s No. 1 C. Swanson, E.T.R.R. Sur. 39. 10¾-in. csg. 248 ft.; drlg. sh. 6,514 ft.

Dr. T. M. Neal's No. 1 fee, Elisha Flack, 4,840 ft.

Strake Pet. Corp.'s No. 1 Poole, Sec. 25, G.H.&H. Sur. Drlg. sh. 9,975 ft.

S. W. TEXAS WILDCATS

Aransas County

Continental Oil Co.'s No. 1 St. Charles Co., R. D. Blassman Sur. 18⅝-in. csg. 290 ft.; T.D. 9,335 ft.; well blew out; caught fire; fire out; well still blowing; hole bridged.

Continental Oil Co.'s No. 2 St. Charles Co., R. D. Blassman Sur.; (relief well to blow out). R.U.

Atascosa County

John Durst's No. 1 Wright, Edw. Morris Sur. S.D. 475 ft.

Red Bank Oil Co. et al's No. 1 J. P. Pratt Francisco de la Garza Sur. 46; 7-in. csg. 2,347 ft.; set 5½-in. lnr. 3,-074 ft.; T.D. 3,072 ft.; swbg.

Bastrop County

C. R. Franklin's No. 1 Oscar McDonald, Martha Baker Sur. T.D. 1,853 ft.; fsg.

Bee County

Bunte Bros., Inc.'s No. 1 J. T. Earnest, Bee Co. Sch. Ld. Sur. 7-in. csg. 5,973 ft.; drlg. 9,350 ft.

Mills Bennett Prod. Co. and Anderson-Prichard Oil Co.'s No. 2 Robinson, J. M. Uranga Sur. (Wlx. test, West Tuleta field). 13⅜-in. csg. 2,537 ft.; 9⅝-in. csg. 7,804 ft.; drlg. sh. 8,626 ft.

Suitex Oil Co.'s No. 1 Wood, Jas. McGeehan Sur. Drlg. sh. 3,736 ft.

Union Prod. Co.'s No. 56 Ray T. Hanson Sur.; (Pettus field). Wlx. test; 10¾-in. csg. 4,856 ft.; drlg. sh. 7,730 ft.

Bell County

J. J. Cormas' No. 1 Jeff Ellis, Elizabeth Berry Sur. Drlg. L. 410 ft.

Bexar County

Joe Noake's No. 1 San Antonio Sub. Irrg. Farm, W. Miller Sur. 180. S.D. 473 ft.

Philtop O. & G. Co.'s No. 2-A Patton, Fernando Rodriguez Sur. T.D. 1,938 ft.; S.D.

J. A. Tarver's No. 1 Florence Lam, Manuel de Luna Sur. 3. 6⅝-in. csg. 1,205 ft.; T.D. 1,692 ft.; cd. bkn. sh. 1,638-92 ft.; S.S.O.; bailed est. 10 bbl. oil P.D. before sanding up; S.D.

J. A. Tarver et al's No. 1 Joseph Leonard, Manuel de Luna Sur. 3. Drlg. 1,360 ft.

Blanco County

E. L. Nixon's No. 3 Crist, John McClenechen Sur. 94. S.D. 1,330 ft.

Burleson County

H. Y. Barnett's No. 1 Giesenschlag, J. W. Hollingsworth Sur. T.D. 1,818 ft.; prep. to make D.S.T.

Caldwell County

Kean & Williamson's No. 1 E. E. Rector, J. Roberts Sur. Drlg. sh. 520 ft.

Calhoun County

Coronado Corp.'s No. 1 K. Welder, Hidalgo Sur., 3 mi. SE Seadrift. "Tight well"; reported to be tstg.; 5½-in. csg. 9,750 ft.; perf. csg. 9,500-9,600-9,700 ft.; rec. S.W.; made sqze. job at 8,580 ft.; prep. to perf. csg.

Ray-Ranger et al's No. 1 W. W. Wilson, V. Garcia Sur. Drlg. 1,250 ft.

Cameron County

Sal Vieja Oil Co. et al's No. 1 Garcia, Santa Isabel gr. Spd.

De Witt County

Atlantic Ref. Co.'s No. 1 Pearl Conwell, Chas. Lockhart Sur. T.D. 8,519 ft.; W.O.

Dimmit County

Alamo Drlg. Co.'s No. 1 McKnight, I.& G.N. Sur., Blk. 13, Sec. 25, Lot 14. R.U.

Duval County

Alaska-Tex. Oil Corp.'s No. 1 W. P. Peters, B.S.&F. Sur. 791. T.D. 3,613 ft.; abd.

C. Andrade's No. 1 Miller, J. M. Ynojosa gr., Sec. 62. 10¾-in. csg. 624 ft.

W. L. Catlin et al's No. 1 Louis Escapule, J. Poltevent Sur. 73. R.U.

Landreth Prod. Co.'s No. 1-A C. M. Robinson, Paul Henry Sur. 116. Drlg. sdy. sh. 1,950 ft.

Mayfair Oil Corp.'s No. 1 Yates, S.A.&M. G.R.R. Sur. Loc.

P. R. Rutherford's No. 1 Clara Driscoll. U. Lott Sur. 243. R.U.

Standard Oil Co. of Texas' No. 1 Rodriguez, San Pedro de Charco Redondo gr. 7-in. csg. 5,691 ft.; T.D. 6,838 ft.; tstd. gas and dist. 6,790-6,838 ft.; P.B. to retest.

Falls County

J. Shaunfield's No. 1 Barganier, J. M. Graham Sur. Bda. L.; S.S.O.; T.D. 1,-

LEGAL

Department of the Interior, United States Land Office, Las Cruces, New Mexico. Notice is hereby given that a lease of the oil and gas deposits in the NE¼ SW¼, SW¼ SW¼, NW¼ SE¼, and E½ SE¼ Sec. 35, T. 17 S., R. 27 E., N.M. P.M., New Mexico, containing 200 acres, in the Empire Oil and Gas Field, is offered to the responsible qualified bidder of the highest bonus per acre pursuant to the provisions of Section 17 of the leasing act of February 25, 1920 (41 Stat. 437), as amended, at the royalty rate scale in the lease form shown in General Land Office Circular 1386, at a sale to be held in the office of the Register of the District Land Office at Las Cruces, New Mexico, at 10 o'clock A. M. on April 3, 1940. The successful bidder must deposit on the date of sale a certified check on a solvent bank, or cash, for 1/5 of the amount of the bid, and file a showing of qualifications to receive the lease required by section 7 of Circular 1386. The remaining 4/5, together with the annual rental in advance at the rate of $1 per acre, must be paid and a $5,000 corporate surety bond must be furnished prior to the issuance of the lease. The bidders are warned against violation of the provisions of section 59 of the United States Criminal Code approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids at the discretion of the Secretary of the Interior. Register, Paul A. Roach, Register.

188 ft.; recmtd. csg.; W.O.; cmt. failed to hold.

Gonzales County

M. T. Huebner's No. 1 M. P. Smith, R. Plummer Sur. T.D. 1,135 ft.

Guadalupe County

Diamond Hair Oil Corp.'s No. 1 W. J. Strey, Josefan de los Cortinos Sur. 49. 5½-in. csg. 753 ft.; T.D. 797 ft.; 40 ft. O.I.H.; will R.U. to pmp.

D. Eickenroht et al's No. 1 Wm. Oelkers, Antonio Maria Esnaurrizar Sur. Drlg. 1,460 ft.

C. E. Euton et al's No. 1 Volkman est., W. J. C. Wilson Sur. 59. T.D. 1,026 ft.; abd.

A. J. Hollifield's No. 1 A. J. Day, Jas. Hinds Sur. T.D. 2,837 ft.; 7-in. csg. 2,357 ft.; P.B. 2,692 ft.; swbd. sulf. wtr., S.S.O.; P.B. 2,415 ft.; acd.; pmpg. 38 B.O. and 5% wtr. per day.

Knute Evjen et al's No. 1 W. C. Brawner, J. D. Pickens Sur. T.D. 2,394 ft.; T.A.

F. W. Nute's No. 1 M. T. Howell, Jacob Darst Sur. T.D. 2,894 ft.; abd.

F. D. Spratt's No. 1 Wm. Zuchl, Claiborne Rector Sur. 38. Drlg. sh. 832 ft.

Hidalgo County

Gulf State Oil Co.'s No. 2 Cardinas, San Salvador del Tule gr. 16-in. csg. 157 ft. cg. sd.&sh. 8,622 ft.

Homer P. Lee's No. 1-A Yturria Town & Imp. Co., Anastacio Villareal gr. Drlg. 3,215 ft.

Humble O. & R. Co.'s No. 1 T. A. Ogg, Rio Bravo subd. S.D. 8,695 ft.

Jim Hogg County

Humble O. & R. Co.'s No. 3 C. T. Mestena O. & G. Co., San Antonio de Balluarte gr. T.D. 6,383 ft.; abd.

Sun Oil o.'s No. 2 East, A.B.&M. Sur. 39. Cg. S.W. sd. 4,088 ft.

Jim Wells County

Henshaw Bros. et al's No. 1 Gaither, Los Presnos de Arriba gr. T.D. 5,753 ft.; abd.

H. H. Howell's No. 1 G. H. Bierstedt, I. &G.N.R.R. Sur. 501. Drlg. 3,320 ft.

Reese, Dunn & Tsesmelis' No. 1 Perez, Manuel Barrera gr. T.D. 5,510 ft.; 5½-in. csg. 3,384 ft.; abd.

Texas Gulf Prod. Co.'s No. 1 Gallagher, Blk. 16, J. H. Gallagher subd. 10¾-in. csg. 608 ft.; cg. 4,430 ft.

Karnes County

Clyde Eckols' No. 1 J. M. Newberry, Carlos Martinez Sur. 5½-in. csg. 3,002 ft.; T.D. 3,008 ft.; perf. csg. 2,942-49 ft.; swbg.

R. W. Ford and Crown Central Pet. Corp.'s No. 1 Ed Jendrusch, Erasmo Seguin Sur. Drlg. 110 ft.

Kendall County

C. M. Dewey's No. 2 Seidensticker, R. Davis Sur. 20. S.D. 950 ft.

Kimble County

Austin Bridge Co.'s No. 1 Wilkinson, Brooks & Burleson Sur. S.D. 195 ft.

J. C. Renfro's No. 1 D. C. Morales, Hrs. of H. Grote, Sur. 423. S.D. 20 ft.

Schwab-Carlyle & Auld's No. 1 Baker, F. C. Stisser Sur. 417. S.D. 15 ft.

Kinney County

Cooper Gas Co.'s No. 1 L. L. Farr, Geo. L. Bledsoe Sur. 835. S.D. 1,925 ft.

Kleberg County

Humble O. & R. Co.'s No. 1 O. J. Mork, Rincon de Santa Gertrudis gr. T.D. 6,909 ft.

Skelly Oil Co.'s No. 1 State, Laguna de Los Olmos gr., Tr. 385. Drlg. sh. 2,230 ft.

Lee County

Fred Pederson et al's No. 1 Brown, David Hudson Sur. T. Glen Rose L. 6,600 ft.; drlg. sdy. L. 7,735 ft.

Live Oak County

H. F. Baker's No. 1 Saunders, Christ Scanlon Sur. 67. S.D. 341 ft.

Hagan & Stewart Drlg. Co.'s No. 2 Reagan, M. Hely Sur. 5. T.D. 784 ft.; 5½-in. csg. 776 ft.

Humphries & Hotchkin's No. 1 South Texas Natl. Bnk., E. M. Adams Sur. T.D. 2,161 ft.; abd.

E. M. Jones' No. 1 West, Lot 400, Blk. of West subd. Cg. 7,730 ft.

Pocono Dev. Co.'s No. 1 San Antonio Joint Stock Ld. Bnk., Richard Everett Sur. 1. R.U.

W. R. Quinn, et al's No. 1 Stolze, J. F. Huizar Sur. 31. S.D. 25 ft.

L. W. Stieren's No. 3 Lange, Thos. Adams Sur. T.D. 1,497 ft.

McMullen County

Gorman & Yoakum's No. 1 Nueces Ld. & Livestock, I.&G.N. Sur. 1. T.D. 1,768 ft.; abd.

F. H. Gohlke's No. 3 Miles, Wm. Kohfler Sur. 78. S.D. 1,078 ft.

C. D. Scarborough's No. 1 First Natl. Bk. of Rosebud, Jas. Garner Sur. S.D. 1,955 ft.

Tybro Oil Co.'s No. 1 First Natl. Bnk. of Cameron, J. M. Campbell Sur. 12. T.D. 1,225 ft.; abd.

Tybro Oil Co.'s No. 1 Martin, H. L. Williams Sur. 18. Drlg. sh. 705 ft.

Milam County

Fritz Fuchs' No. 1 Unaseh, Jose Justo Liendo Sur. T. clk. 1,100 ft.; T.D. 1,895 ft., L.; may run csg. to test.

Medina County

T. J. Tapp's No. 1 Bendele, F. Sauer Sur. 117. S.D. 205 ft.

York Pet. Co.'s No. 1 Kate Smith, Marie Ihnken Sur. 11. T.D. 950 ft.; 5½-in. cg. 690 ft.; swbd. small amt. oil; abd.

Nueces County

Houser-Warren & Ginther's No. 1 Lynn Davis, Palo Alto gr. Drlg. sh. 5,880 ft.

Humble O. & R. Co.'s No. 1 D. F. Duncan, Blk. 50, Lot 2, Drk.

John Manley et al's No. 1 Ruegg, Geo. H. Pauls subd. of Driscoll ranch. Loc.

Wellington Oil Co. and Seaboard Oil Co.'s No. 1 Swenson, Santa Petronilla Sur. Drlg. sh. 3,606 ft.

Refugio County

Norsworthy Prod. Co.'s No. 1 Wood, John Sinnott Sur. T.D. 6,508 ft. (cor.). S.D.

H. J. Porter's No. 1 R. H. Morrow, E. Perry Sur. R.U.

San Patricio County

Texas Gulf Prod. Co.'s No. 1 San Antonio Loan & Tr. Co., M. McAuley Sur. Drlg. sh. 3,330 ft.

Fred Wood et al's No. 1 C. E. Hart, Wm. G. Burgess Sur. 5½-in. csg. 7,250 ft.; tstd. S.W. 6,910-13 ft.; perf. csg. 6,900-11 ft.; swbd. S.W.; S.O.; S.D.

Starr County

Lynes & Robertson's No. 1 Villareal, C. C.S.D.&G.N.R.R. Sur. 241. Loc.

Sun Oil Co.'s No. 1 W. G. Lehr, C.C.S.D. R.G.N.G.R.R. Sur. Drlg. 3,436 ft.

Sun Oil Co.'s No. 1 Rodriguez, Santa Teresa gr. Cg. 6,670 ft.

Syndicate Oil Corp.'s No. 1 Sanchez, Santos Sanchez Sur. 344. Drlg. sh. 930 ft.

W. W. Zimmerman's No. 1 B. D. Wood, V. Vela Porc. 84. T.D. 2,211 ft.; abd.

Travis County

O. L. Patton's No. 1 I. P. Jones, Rueben Hornsby Sur. 17. Drlg. sh. 320 ft.

J. C. Tittle's No. 1 C. A. McEachern, O. Buckman Sur. 40. S.D. 820 ft.

L. M. White et al's No. 1 P. C. Wells, J. Harper Sur. 42. Run 7-in. csg.; drlg. L. 1,450 ft.

Val Verde County

Joiner Oil Co. et al's No. 1 Clyde Sellers. S.D. 1,822 ft.

Victoria County

Colton & Colton's No. 1 W. C. Buckholtz, F. G. Hidalgo Sur., Lot 27, 10¾-in. csg. 710 ft.; S.D. 5,400 ft.; 5½-in. csg. 2,685 ft.; rec. S.W.; abd.

Mayo & Renwar Oil Co.'s No. 1 Bayer, Garcia Sur. T.D. 6,485 ft.; 7-in. csg. 6,333 ft.; rec. S.W. 5,688-91 ft. and 5,780-85 ft.; abd.

John Mayo et al's No. 1 Hubalak, V. Garcia Sur. R.U.

Mayo, Thompson Drlg. Co.'s No. 1 Ragsdale, V. Garcia Sur. S.D. 5,375 ft.; D. S. stk.; abd.

Webb County

O W. Kilam's No. 64 Bruni, M. H. Rodriguez Sur. 446. T.D. 1,879 ft.; 5½-in. csg. 1,830 ft.; perf. csg. 1,802-06 ft.; flwg. 5 B.O. and 35 B.S.W. per day; ⅝ in. ck.

O. W. Killam's No. 1 Puig, Albercas de Arriba gr. T.D. 2,563 ft.; abd.

Mayfair Oil Corp.'s No. 1 A. M. Bruni, M. H. Rodriguez Sur. 446, 10¾-in. csg. 20 ft.; T.D. 1,852 ft.; 5½-in. csg. 1,852 ft. flwd. S.W.; small amt. of oil; abd.

V. G. Schimmel's No. 1 Volpe, Mary H. Pennell Sur. 698. Drlg. sh. 3,100 ft.

Sinclair Prairie Oil Co.'s No. 1 Callaghan Ld. & Cattle Co., B.S.&F. Sur. 585. 13⅜-in. csg. 1,598 ft.; drlg. sh. 5,408 ft.

Tide Water Asso. Oil Co.'s No. 7 Bruni, Blk. 7, M. Arispe gr. (deep test Bruni field). T.D. 8,959 ft.; well blew out; hole bridged; stk. D.S.; prep. to P.B. and test approx. 5,600 ft.; perf. D.P. 5,636-45 ft. and 5,621-31 ft.; tstd. dry; sqzd. off; perf. csg. 5,620-30 ft.; tstd. 4 B.O.P.D.; 2,000,000 cu. ft. gas; ¼-in. ck.; T.P. 150 lb.; 350 lb. on D.S.; flwg. small amt. of oil per day.

Williamson County

C. C. Lanier's No. 1 Guental, Harry Cooke Sur. R.U.

H. C. Lefors' No. 1 H. J. Prismeyer, Jehu Bevil Sur. 56. S.D. 1,936 ft., L. Taylor Ref. Co.'s No. 2 Hurta, P. Coursey Sur. Drlg. clk. 940 ft.

Wilson County

Henshaw Bros.' No. 1 E. W. Schneider, Don Casper Flores Sur. 10-in. csg. 99 ft.; T.D. 2,896 ft.; fsg.

W. D. Moore et al's No. 1 Lorenz, Morris May Sur. S.D. 75 ft.

E. E. Young's No. 1 O. D. McMeans, C. W. Parrott Sur. R.U.

Zapata County

J. P. Martin et al's No. 1 Serapio Vela, El Grullo gr. T.D. 3,108 ft.; sdtrkd.; T.D. 3,505 ft.; 5½-in. csg. 2,906 ft.

Zavala County

H. F. Wilcox O. & G. Co.'s No. 2 Storey G.W.T.&P.R.R. Sur. 19. R.U.

WEST TEXAS WILDCATS

Andrews County

Illinois Oil Co.'s No. 1 University, Sec. 14, Blk. 12, Univ. Sur. R.U.R.

Richmond Drlg. Co. and T. F. Hunter's No. 1 University, 660 ft. N and E lines of Sec. 21, Blk. 11, University Sur. Prep. recmt. 7-in. 5,172 ft.

Concho County

Charter O. & G. Co.'s No. 1 T. Y. Hill, SW part of Julius Frederick Sur. 1693, Abst. 198. Fsg. 861 ft.

Floyd Dodson's No. 1 Wilson, Thomas Green Sur. 1; 3,500-ft. test. Prep. U. R. 10-in. csg. from 2,197 to 2,400 ft., T.D.

Crane County

Gulf Oil Corp.'s No. 5 M. B. McKnight, Sec. 1, Blk. 21-B, P.S.L. Sur. Drlg. 6,233 ft.

Gulf Oil Corp.'s No. 1-K University, 330 ft. N and E lines, Sec. 2, Blk. 31, University Sur. W.O.C. 1,143 ft.

Gulf Oil Corp.'s No. 12 Waddell, Sec. 30, Blk. 26-B, P.S.L. Sur. 12-in. 532 ft. S.O. 3,215-20 ft.; S.S.G. 3,635 ft.; 8-in. csg. cmtd. at 3,713 ft.; S.D.R. 3,763 ft.

Crockett County

Continental Oil Co.'s No. 2 Todd, 1,980 ft. S and W lines of Sec. 29, Blk. W. X. G.C.&S.F. Sur. Skd. rig W; drlg. 4,945 ft.

Soma O. & G. Synd.'s No. 1 W. T. Noelke, NW part Sec. 30, Blk. GG, H. E.&W.T. Sur. Spd.&S.D.

Ector County

Ralph R. Gill's No. 1 Parker, SE¼ Sec. 12, Blk. 45, T-2-S, T.&P. Sur.; deep Holt horizon test. Drlg. 4,479 ft.

M. A. Grisham et al's No. 1 R. B. Cowden, 600 ft. from N and E lines, Sec. 4, Blk. 45, Twp. 1n (deep test), T.&P. R.R. Sur. Drlg. 5,352 ft.

Landreth Prod. Corp.'s No. 1 T.X.L., NW cor. Sec. 3, Blk. 43, T-1-S, T.&P. Sur.; deep Holt-horizon test. Prepg. to dpn. from regular pay zone to deep level; sat. and por. 5,153-96 ft.; swbg. and tstg. 66 B.F. in 12 hrs., 6 per cent wtr.

Richmond Drlg. Co. and Rhodes & Tompkins' No. 1 J. L. Johnson, NW cor. Sec. 25, Blk. 43, T-1-S, T.&P. Sur.; deep Holt horizon test. T. solid L. at 3,940 ft.; drlg. 4,052 ft.

Western & Southern Oil Co.'s No. 1 Smith, NW cor. Sec. 6, Blk. 42, T-1-S, T.&P. Sur.; deep Holt-horizon test. Rng. 5½-in. csg. 4,152 ft.

Gaines County

Stanolind O. & G. Co.'s No. 1 T. S. Riley, Sec. 11, Blk. H.D.&W. Sur. Shot 4,762-4,864 ft.; C.O.; bailed 1 bbl. hourly before shot; T.D. 4,864 ft.; swbd. 10 B.O. in 8 hrs.; bailed dry and bailed 10 B.W. in 9 hrs.; pmpd. 30 B.O. and 30 B.W. in 24 hrs.; tstg.

Hockley County

Denver Prod. & Ref. Co. and Helmerich & Payne, Inc.'s No. 1 Whiteface Farms, 660 ft. from S and E lines Labor 22, Lgt. 77, Reeves C.S.L. Sur. Had 72 ft. of sat.; drld. plug and found no shows; T.D. 4,796 ft.; tstd. sul. wtr.; prep. P.B. and test.

Hudspeth County

Haymon Krupp Oil & Ld. Co.'s No. 1 Briggs, Sec. 24, Blk. 73, Twp. 7, T.& P. Sur. C.O. to D.D. at T.D. of 6,015 ft.

Loving County

J. E. Whitesides' No. 1 fee, Sec. 24, Blk. 76. Prep. run 10-in. 1,132 ft.; S.S.O.; drlg. 3,585 ft.

Lynn County

Guthrie Lake Oil Co.'s No. 1 Mary L. Shoe, Sec. 20, Blk. 8, E.L.R.R. Sur.; 800-ft. test. Rng. 5-in. 626 ft.

Mitchell County

Ewing & Hanes' No. 1 G. I. Grable, Sec. 195, Blk. 3, H.&G.N. Sur.; 1,800-ft. test. S.D.O. 780 ft.

N. V. Hilburn's No. 1 E. T. Strain, Sec. 82, Blk. 97, H.&T.C. Sur. S.D.R. 925 ft.

Pecos County

Humble O. & R. Co.'s No. 1 Young, Sec. 33, Blk. 10, H.&G.N. Sur. Top detrital 5,185 ft.; prep. core 5,756 ft.; T. Simpson at 5,624 ft. after logging 504 ft. of detrital.

B. McCandless and General Crude Oil Co.'s No. 1 Virginia W. Crockett, Sec. 5, Blk. 110, T.C.R.R. Sur. T. Ellenburger 4,401 ft.; tstg. est. 6,000,000 cu. ft. gas after acd.; rng. tbg.; T.D. 4,479 ft. est. 4,000,000 cu. ft. gas and 365 B.O. P.D.; made 531 B.O. in 5 hrs.; S.I.

Skelly Oil Co.'s No. 1 J. S. Masterson (Ordovician test), Sec. 101, Blk. 10, H. &G.N. Sur. Topped Ellenburger 44 ft. high; flwd. 32 B.O.P.H.; made 518 B. O. in 10 hrs.; S.I. 5,614 ft.

R. L. Walker's No. 1 White & Baker, Sec. 86, Blk. 194, G.C.&S.F. Sur. Drlg. 1,100 ft.

Reeves County

T.A.T. Oil Co.'s No. 1 U. G. Orenderff, Sec. 10, Blk. 59, P.S.L. Sur. S.D.O. 1,901 ft.

Scurry County

Coffield & Guthrie's No. 1 Reiter, Sec. 155, Blk. 97, A.T.&T.C. Sur. P.B. 2,900 ft.; swbg.

Stonewall County

Shell Oil Co., Inc.'s No. 1 Smith, Sec. 143, Blk. 1, H.&T.C. Sur. Drlg. 5,508 ft.

W. I. Southern's No. 2 Carlisle, Sec. 293, Blk. D, H.&T.C. Sur. T. Ellenburger 5,540 ft.; S.S.O. 6,543 ft.; drlg. 6,605 ft.

Terrell County

E. M. Thomasson's No. 2 Bates, Sec. 30, Blk. 1, L&G.N. Sur. Fsg. 274 ft.

Terry County

Geo. P. Livermore's No. 1 M. E. Jacoonson, Sec. 6, Blk. 11-D, C.&M. Sur. Loc.

Tide Water Asso. Oil Co.'s No. 1 Lowe, SW part Sec. 3, Blk. 37-C, P.S.L. Sur. Loc.

Tom Green County

B. C. Mann's No. 1 Joe Funk, 330 ft. N, 1,650 ft. E lines, Sec. 34, Blk. 5, H.& T.C. Sur. Drlg. 1,047 ft.

Dan Short's No. 1 J. G. Davidson, 2,161 ft. from SL, 2,493 ft. from NW cor. L. P. Moore Sur. S.S.O.&G. 2,660-65 ft.; S.D.R. 3,325 ft.

Ward County

Gulf Oil Corp.'s No. 5 Wristen, Sec. 13, Blk. 5, H.&T.C. Sur.; scheduled Ordovician test. Drlg. 5,378 ft.

Kenneth Slack's No. 1 Bird Hayes, Sec. 148, Blk. 34, H.&T.C. Sur. Drlg. 4,668 ft.

Yoakum County

Sloan & Zook and T. N. Sloan's No. 1 J. E. Fitzgerald, Sec. 22, Blk. D, Gibson Sur., extreme NE cor. of county, 7-in. csg. 4,812 ft.; T.D. 5,658 ft.; prep. D.D.

TEXAS PANHANDLE

Lipscomb County

Phil O'Neil's No. 1 Jacob Koch, NW SW Sec. 539, T.&T.C.R.R. Sur. S.D. 1,100 ft.

Ochiltree County

James R. Macon et al's No. 1 W. R. Norris, SW SE Sec. 212, Blk. 48, H.&T.C. Sur. T.D. 6,274 ft.; test sec. at 5,000 ft.; est. 6,000,000 cu. ft. gas on D.S.T.; tstg.; bailing 6,274 ft.; unloaded csg. at well and preparing to test increasing shows of oil and gas; S.D.W.O. 6,274 ft.

Potter County

Canadian River Gas Co.'s No. 1 City of Amarillo, in city limits just north of city. Drlg. 3,837 ft.

Lee Whitaker's No. 1 D. Pavillard, Sec. 101, Blk. 2, A.B.& M. Sur. Fish out; T.A. 915 ft.

Sherman County

I.T.I.O. Co.'s No. 1 S. C. Bryant, C NW¼ Sec. 369, Blk. T-1, T.&N.O. Sur. W.O.C. 2,357 ft.

E. C. TEXAS WILDCATS

Anderson County

R. H. Williamson's No. 1 O. G. Rogers, Wm. Greenwood Sur., 6 mi. SW of Elkhart. Had gas blowout 4,380-90 ft.; under control; est. 30,000,000 cu. ft. gas; flwg. dry gas.

Angelina County

Ginter Bros.' No. 7 Copes hrs., J. Morin Sur., 3 mi. E of Diboll. W.O.C. 2,284 ft.

Camp County

W. C. McGlothlin's No. 1 Venters, S. Wright Sur., 3 mi. SE Leesburg. R.U. to D.D. to Pett. zone; prep. set csg. to test show in Pett. L. 7,943-90 ft.; had 47 ft. of sat. and por.; S.D. for title trouble at 8,087 ft.; well has not been opened.

Cherokee County

C. C. Lanier's No. 1 W. O. Reagan, W. T. Smith Sur., 2½ mi. E of Mixon. Drk.

R. D. Salisbury's No. 1 W. M. Shankle, J. A. Manchaca Sur., 1½ mi. NE Chilton. P.B. 1,103 ft.; S.D.; W.O.

Fannin County

C. Newburn's No. 1 A. G. Allen, M. Caldwell Sur., 7 mi. NE of Banham. Laying wtr. lines.

Freestone County

C. F. W. Young's No. 1 Ray Simmons, M. DeCantona Sur., 1½ mi. W of Simmsboro. Loc.

Gregg County

Roger Lacy's No. 1 Lacy, S. P. Ford Sur., 3 mi. SW of Longview; deep Trinity gas test. R.U.

Henderson County

Dilworth Hager's No. 2 Coleman & Faulk, R. S. Rayburn Sur., 3½ mi. NW of LaRue. R.U.

Hopkins County

W. P. Vaughn's No. 1 Employers Reliance, F. Hopkins Sur., 3 mi. N of Tira. Drlg. 150 ft.

Houston County

J. C. Wynne et al's (Shell Oil Co., Inc.) No. 1 G. E. Dorsey, M. Sallas Sur., 2½ mi. S of Percilla; E 102 ac. of tr.; 10,000-ft. test. D.S.T. 8,541-76 ft.; rec. mud cut with gas and oil; taking sidewall cores below 10,000 ft.; contract depth of 10,900 ft. completed; no shows of oil below Glen Rose; perf. csg. 10,794-10,822 ft. with 112 shots; swbg. and tstg.

Kaufman County

W. H. McGee's No. 1 Rutland Savings Bnk., John Baker Sur., 2¼ mi. NE of Tulosa. Drlg. 2,600 ft.

T. G. Shaw, Tr.'s No. 1 Angus Wynne, B. S. Newman Sur., 8 mi. E. Kaufman. lower Trinity test. S.D. 130 ft.; (corrected report).

Limestone County

Peyton Bros.' No. 1 Harris, P. Varella Sur. Drlg. 5,007 ft.

J. J. Tyrell's No. 1 A. G. Easterling, J. L. Chavert Sur., 11 mi. E of Groesbeck. S.D. 4,576 ft.

McLennan County

T. M. Smart's No. 1 J. W. Mann, C. O'Campo Sur., 4 mi. S of Waco. S.D. 1,327 ft.

Nacogdoches County

Melrose Oil Co.'s No. 2 C. N. Wilson, Hall & Mora Sur., 300 ft. SE of No. 1 Wilson abd. at 2,100 ft. in Jan. Loc.

Navarro County

C. F. Carter's No. 1 Allen Eden, M. Shire Sur., 2 mi. NE of Angus. S.D. 1,201 ft.

Guy Sitton's No. 2 R. D. Fleming, John Harris Sur., 450 ft. E of No. 1 dry hole. Bailed S.S.O. and S.D. for test at 1,625 ft.

W. H. Warren's No. 1 L. Grey, E. Powers Sur., 9 mi. SE of Kerens. S.D. 660 ft.; T.D.

Robertson County

Rhett Wilder's No. 1 Moise Cerf, J. Erwin Sur., 7 mi. S of Franklin. S.D. 40 ft.

Rusk County

Jeff Bolton's No. 1 Hall Wood, J. I. Sanches Sur., 2½ mi. NW of New Salem. Lost circ. and skd. rig to start new hole; T. Wdbne. with sat. at 4,145 ft.; S.S.O. 4,201 ft.; S.D. to test.

A. O. Whittington's No. 1 Kangerga Bros., Ign. Castro Sur., 9½ mi. N and slightly E of Pirtle. S.D. 80 ft.

Smith County

Sun Oil Co.'s No. 1 E. B. Huddle, Wm. Dickerson Sur., 2 mi. S of discovery dist. producer in Chapel Hill area; third D.S.T. failed; may test again or may P.B. to Glen Rose L.; sat. drld. from 7,983-8,019 ft.; T. Pett. 7,930 ft.; T. Tr. Pk. 8,090 ft.; W.O.C. 5½-in. csg. at 7,870 ft.

Trinity County

Davis & Co.'s No. 1 Texas Long Leaf Lbr. Co., A. Henry Sur., 5 mi. S of Loveland, Cg. 2,315 ft.

Gossage et al's No. 1 First Natl. Bnk., B. F. Wright Sur., S of Trinity. R.U. and S.D.

Van Zandt County

J. B. Daniels' No. 1 W. R. Odom, J. Garcia Sur., 4 mi. NE of Mabank. Drk.

EAST TEXAS

(Border Counties)

Harrison County

J. A. Hughes' No. 1 Taylor, H. McNutt Sur. Blg. 2,612 ft.; S.O.

Marion County—Other

B. I. Daniels' No. 1 T. O. Livingston, G. Coore Sur. T.D. 2,330 ft.; W.O. csg.

M. D. Fitzwater's No. 1 C. Moseley, 330 ft. SE cor. 100-ac. tr., W. H. Burton Sur. T.D. 1,529 ft.; dropped in cavity at 1,519 ft.; W.O.

L. Lindsey's No. 1 Hart, G. Coore Sur. Set 5½-in. csg. 2,264 ft.; W.O.C.

Sanders & Wyckliffe's No. 1 W. P. Stiles, M. Noll Sur. Set 6-in. csg. 2,218 ft.; T.D. 2,408 ft.; H.F.O.; W.O.S.R.

Marion County—Rodessa

C. M. Beckett's No. 1 Perry, 466 ft. NW cor. Perry 126-ac. tr., C. Grayson Sur. R.U.

Holcomb & Thomason's No. 1-A Madine, 400 ft. WL, 467 ft. NL, 33.6-ac. tr., A. D. S. Coy Sur. Set 9⅝-in. csg. 1,840 ft.; Hill sd. 5,979 ft.; Gloyd 6,092 ft.; set 6-in. csg. 6,118 ft.; W.O.C.

Shelby County

Earl McDaniels et al's No. 1 J. S. Swann, 250 ft. NE cor. 100-ac. tr., Ann Gray Sur. Drk.

Superior Oil Co.'s No. 1 Pickering Lbr. Co., 990 ft. E, 330 ft. N, SW cor. Lot 4, W. J. Crane Sur. T. Midway 1,555 ft.; T. Cane River 1,850 ft.; T. Annona 1,955 ft.; T.D. 2,658 ft.; P.B. 2,625 ft.; tstd. 5% oil and 95% mud and S.W.; recmtd. 2,615 ft.; 7-in. csg. set 2,595 ft.; oil sd. 2,618-21 ft.; installing pmpg. unit.

WEST CENTRAL TEXAS DISTRICT

Brown County

A. M. Stalcup's No. 1 J. C. Morris, 900 ft. S, 700 ft. E lines of Morris tr. in John Goodwin and W. B. Hester Surveys. Drlg. 835 ft.

M. R. Staurd's No. 1 E. Hennigan, NW M.E.P.&P. Sur.; 1,000-ft. test. Loc.

Callahan County

D. Fox and E. L. Dunn's No. 1 A. and G. Berry, NE pt. Sec. 78, B.O.A. Sur., 950-ft. test. Drlg. 860 ft.

N. D. Gallagher's No. 1 E. Grisson, SE pt. Sec. 2, Blk. 8, S.P. Sur. Spd. & S.D.

Green & Owens' No. 1 Murray, 156 ft. from N and 1,725 ft. from E lines of Jacob Track Sur. 761. S.D. 867 ft.; funds.

W. Lee's No. 1 H. W. Ross, 2,420 ft. W, 1,540 ft. S lines, Sec. 98, B.B.B.&C. C. Sur. R.U. mch.

J. L. Reeves' No. 1 N. A. Estes, SW¼ Sec. 4, Blk. 8, S.P. Sur., 2½ mi. S of Bowles pool. M.I.M.

A. L. Thomas' No. 1 Abram, NW pt. Sec. 1, B.B.B.&C. Sur. M.I.M.

Coleman County

Anzac Oil Corp.'s No. 1 McCord, 2,200 ft. E, 2,196 ft. S of B.B.B.&C. Sur. Spdg.

J. C. Ort's No. 1 Emet Walker, SE cor. Hicks Sur. W.O.C. 700 ft.

Robertson & Bradford's No. 1 Morris, 330 ft. N, 1,582 ft. W lines, Blk. 2, G.H.&H. Sur. Spd.&S.D.

Comanche County

K. R. March's No. 1 P. Scott, SE cor. NE SW Sec. 25, Blk. 2, H.&T.C. Sur.; 1,200-ft. test. Loc.

J. M. Russell's No. 1 P. Scott, SE SW Sec. 25, Blk. 2, H.&T.C. Sur. Loc.

Coryell County

Kistler O. & G. Co.'s No. 1 Barnes, 360 ft. SE line, 3,700 ft. NE line of H. Farley Sur., 3 mi. NE of Gatesville: 2,500-ft. test. Loc.

Eastland County

Bradford & Robinson's No. 1 J. P. Morris, 330 ft. N and W lines of E½ W¼ Sec. 176, G.H.&H. Sur. Loc.

Butler & Horne and E. J. Keoughan's No. 1 L. Waters, Sec. 83, Blk. 3, H.& T.C. Sur. Prep. to abd. 3,515 ft.

Dobbs Oil Corp.'s No. 1 Mrs. R. L. Poe, 1,320 ft. from S and E lines, of SE¼ Sec. 37, Blk. 3, H.&T.C. Sur. Drlg. 500 ft.

Dobbs Oil Corp.'s No. 1 Thomasson, S. H. Key Sur., 330 ft. from N, 846 ft. from E lines of 80-ac. tr. Drlg. 450 ft.

Hickok Prod. & Dev. Co.'s No. 1 Wright & Harrell, 2,485 ft. from east, 2,845 ft. from S lines of J. B. Hozle Sur., 4 mi. NE of Cisco. U.R. 848 ft.; (corrected report).

States Oil Corp.'s No. 1 V. N. Owens, NE Sec. 23, Blk. 2, T.&N.C. Sur. Loc.

E. E. Thate's No. 1 Smith, T. Moffett Sur. 246. Loc.

Erath County

T. Gray's No. 1 C. Young hrs., NW cor. of Stephen Smith Sur., Abst. 682, H. &T.C. Sur.; 6,000-ft. test. R.U.

T. G. Jackson's No. 1 J. W. Taylor, Prater Sur., Abst. 1029, 4 mi. NE of Desdemona. Drlg. 3,285 ft.

E. H. Young's No. 1 J. B. Mills, J. Harry Sur., 5 mi. NW of Dublin; 3,500-ft. test. M.I.M.

Hamilton County

A. J. Caldwell's No. 1 W. W. Jones, 1,002 ft. from NE, 150 ft. from SE lines of W. H. Crowder Sur. S.D.O. 1,315 ft.

Wallace & Wallace's No. 2 C. E. Lund, C S½ E 20 ac., N½ SW¼, R. J. Bailey Sur. 51. Csg. 300 ft.; drlg. 1,932 ft.

Jones County

C. W. Bryon's No. 1 L. B. Gray, NW cor. S½ NW¼ Sec. 25, D.&D.A. Sur.; Palo Pinto L. test. Drlg. 3,350 ft.

Erin Pet. Co.'s No. 1 J. M. Caton, Sec. 4, Orphan Asylum Lds. Tstg. sat. 3,360-3,404 ft.; P.B. 3,390 ft.; flwd. only sul. wtr.; S.D.O. 3,390 ft.

J. E. Farrell's No. 1 F. B. Reid, NW¼ Sec. 31, D.&D. Sur.; 3,500-ft. test. Drlg. 2,110 ft.

Humble O. & R. Co.'s No. 1 Ed Clift, 453-ac. tr. in E½ of Ambrose Crain Sur. 214. Drlg. 1,810 ft.

T. D. Humphrey's No. 1 H. C. Hall, SE Sec. 1, Blk. 17, T.&P. Sur., 5 mi. N of Hawley pool. U.R. 1,700 ft.

Iron Mountain Oil Co.'s No. 1 I. F. Wiley, 330 ft. from S and E lines SW¼ Sec. 14, Deaf & Dumb Ld. Drlg. 250 ft.

Keeler's No. 1 Radford, SE¼ Sec. 20, Blk. 4, H.&T.C.R.R. Sur. S.D.; W.O. 1,800 ft.

Merry Bros. & Perini's No. 1 S. L. Hodges, SW¼ S½ A. Bell Sur. 6; 2,150-ft. test. U.R. 1,542 ft.

Lewis Prod. Co.'s No. 1 M. T. Ramsey, NE cor. Sec. 80, Blk. 14, T.&P. Sur.; 2,000-ft. test. Loc.

Roberts' No. 1 J. Jeffreys, Sec. 7, Blk. 15, T.&P. Sur., 1½ mi. W of Sandy Ridge pool. T. Palo Pinto L. 3,466 ft.; topped sat. 3,478-89 ft.; tstd. sul. wtr.; prep. to abd. 3,665 ft.

W. I. Southern's No. 1 A. A. Hayden, G. Martinez Sur., S of Anson on west side of Prichard pool; 4,000-ft. test. Drlg. 1,550 ft.

Palo Pinto County

J. Jones' No. 1 R. H. Gauldin, NW cor. Sec. 1743, T.E.&L. Sur. S.D.O. 1,510 ft.

E. P. Wilson's No. 1 F. M. Watson, NW pt. of Sec. 10, Blk. 2, T.&P. Sur.; 3,250-ft. test. Drlg. 3,165 ft.

Parker County

Brown & Gardner Bros.' No. 1 Gilbert, T.&P. Sur., Abst. 1958. S.D.O. 3,905 ft.

E. R. Marchman's No. 1 G. W. Keeling, F. Lidely Sur., Abst. 829, 1½ mi. W of Springtown; 3,500-ft. test. M.I.M.

Runnels County

J. E. North's No. 1 J. W. Reese, Day Ld. & Cattle Co., 2½ mi. S of McCullen. W.O.C. 2,030 ft.

Shackelford County

Georgian Oil Corp.'s No. 1 Black ranch, C NE¼ of T.E.&L. Sur. 390, 10 mi. NE of Albany; Ordovician test. C.O. 2,552 ft.

Jones & Stasney's No. 1 L. G. Davis, SE SW Sec. 50, Blk. 13, T.&P. Sur.; 1,600-ft. test. Drlg. 1,507 ft.

Swann & Gorsuch's No. 1 Sam Lazarus, SE SE Sec. 80, Blk. 13, T.&P. Sur. M.I.M.

Andrew Urban, Jr.'s No. 1 T. T. Brooks, 150 ft. N and W lines of NE 40 ac. of 106-ac. tr. in Sec. 90, University Lds. Sur. Loc.

C. W. Waddington's No. 1 J. W. Smith NW pt. of Sec. 56, L.A.L. Sur., 750-ft. test. S.D.O. 589 ft.

Stephens County

Panhandle Ref. Co.'s No. 1 Frank Magers, SE Sec. 1, Blk. 3, S.P. Sur., 1¾ mi. N of Fagg area. Drlg. 2,115 ft.

Pitzer & West and Brazos-Young Oil Corp.'s No. 1 H. Compton, SW SW Sec. 9, O.A.L. Sur., 1 mi. SE of Loving pool; 3,600-ft. test. Loc.

Throckmorton County

Falls Prod. Co.'s No. 1 J. C. Parker, SE pt. Sec. 990, T.E.&L. Sur.; 4,000-ft. test. Loc.

Normandie Oil Corp.'s No. 1 Travis Co. Sch. Lds., Sec. 37, Abst. 254; 5,500-ft. test. S.D. 2,100 ft.

Taylor County

Texas Pacific Coal & Oil Co.'s No. 1 N. A. Reidenback, 990 ft. from N and W lines of Lot 19, Lge. 146 County Sch. Lds. Drlg. 1,280 ft.

J. C. Turner's No. 1 E. A. Sheppard, NE SW Sec. 19, B.A.L. Sur. Drlg. 1,382 ft.

NORTH TEXAS WILDCATS

Archer County

Clark-Cox's (Deep Rock Oil Co.) No. 1 J. M. McCarty, NW cor. C. C. Brown, Abst. 20. Drlg. 3,850 ft.

Continental Oil Co.'s No. 1 L. F. Wilson, NE cor. SW¼ Sec. 20, H.&T.C. Sur. (1½ mi. E of Hull-Silk). 6⅝-in. 5,138 ft.; T.D. 5,250 ft.; test S.G.; treated 6,000 gal. acd.; now P.B. to test upper pays.

Fish et al's No. 1 A. B. Claggett, 150 ft. from W and 850 ft. from N lines of 200-ac. tract in Rachel Story Sur., Abst. 373. Loc.

Geo. B. Golden's No. 1 J. C. King, NE cor. Sec. 2422, T.E.&L. Sur. Loc.

N. D. Goldsmith's No. 1 A. P. Neal, 1,750 ft. from S and 150 ft. from W lines, Sec. 10, D. White Sur., Abst. 673. Loc.

Hedrick Oil Co.'s No. 1 L. W. McCrory, SW cor. Lot 2, Blk. 94, A.T.N.C.L. Sur., 2½ mi. SE of Mankins pool. Drlg. sh. &L. 3,621 ft.

Roeser & Pendleton's No. 1 J. R. Parkey, Sec. 11, Blk. 3, H.&T.C. Sur. (north outpost to Mankins deep pool). Drlg. 4,175 ft.

E. F. Scott's No. 1 York, SE cor. SW¼ Sec. 1861, T.E.&L. Sur. Spd. & S.D.

C. W. Snoddy's No. 1 G. & W. Webb, NW cor. Sec. 1897, T.E.&L. Sur. Drlg. 910 ft.

Waldo E. Stephens et al's No. 1 Hattie, B. Adae, SE part of Blk. 7, Palo Pinto Co. Sch. Lds., 3 mi. SE of Griffin pool. T.D. 5,100 ft.; S.D.O.

Baylor County

Hattie B. Madden's No. 1 J. J. James, 2,000-ft. test located 1,650 ft. from N and 150 ft. from E lines of Sec. 150, T.&N.O.R.T. Sur. S.D. 1,060 ft.

Clay County

Mid-Union Drilling Co. et al's No. 1 S. E. Oliver, SE cor. Sec. 2646, T.E.&L. Sur. (4,100-ft. test). Bldg. road; loc.

Shell Oil Co., Inc.'s No. 1 Davis, Sec. 93, J. H. Belcher Sur. O.W.D.D.; C.O. 5,136 ft.

Cooke County

Cranfill & Staley's No. 1 S. H. Peery, SW B.B.B.&C. Sur., Abst. 145. S.D. 2,505 ft.

G. V. Minnish's No. 1 Stout & Brewer, S½ of Brewer tract, J. Rodriguez Sur., Abst. 880. Loc.

Mudge Oil Co.'s No. 1 Bonner, 330 ft. from S and E lines of E 30 ac. of W 61 ac. of S 101 ac., A. Emanuel Sur., Abst. 1196. Drlg. 1,718 ft.

Mudge Oil Co.'s No. 1 Sam Seagrave, 330 ft. from SW cor. of 193-ac. lease, O. M. Gray Sur., Abst. 415. Spud and S.D.

C. E. Sykes' No. 1 H. Christian, 1,000 ft. from W and SW lines, J. P. Bailey Sur., Abst. 70. Drlg. 3,382 ft.

Cottle County

J. E. Burns et al's No. 1 J. E. Moss, Sec. 5, Blk. L, A. Forsythe Sur. Jnkd. 225 ft.; skd. 20 ft. S; S.D. 1,823 ft.

Denton County

Jones Drlg. Co.'s No. 1 H. Chapman, L. Moore Sur., Abst. 824. Tstg. 1,410 ft.; cg. 1,600 ft.

Foard County

Domain Oil Co.'s No. 1 Wilson, Marshall Univ. Sur. Drk.

Ohio Oil Co.'s No. 1 M. E. Rasberry, NE cor. Sec. 26, S.P. Sur., 5,000-ft. test. Drlg. 225 ft.

Hardeman County

Carter & Taylor's No. 1 Norton, NW cor. 91-ac. tr. in Blk. 3, Robt. Young Sur., 16 mi. N of Quanah. Drlg. 1,170 ft.

Norris & Gilbert's No. 1 Robert Weekley, SW SE Sec. 87, Blk. 16, H.&T.C. Sur. Drlg. 1,210 ft.

Jack County

W. L. Forbes et al's No. 1 N. W. Davis, B.B.&C. Sur. Drlg. 2,511 ft.

Harper Pet. Co.'s No. 1 J. W. Kinder, SW¼ Sec. 2667, T.E.&L. Sur., Abst. 762. T.D. 2,160 ft.; S.D.

H. R. Smith's No. 1 I. G. Yates, SW cor. John Holderman Sur., 6 mi. NW Jacksboro. Spd. and S.D.

Montague County

W. H. Gant and Continental's No. 1 J. L. Brown, Sec. 58, E.T.R.R. Sur. 6⅝-in. 6,843 ft.; brkn. sdy. L. S.O. 6,843 ft.; treat. 8,000 gal. acd.; test showed O.& G. 7,036-56 ft.; T.D. 7,333 ft.; rng. 5-in. inr. 6,843-7,333 ft.; fsg. swb. and 5,800-ft. line; set retainer 6,500 ft.; perf. 52 shots 6,000-6,400 ft.; shot 10 qt. 6,470-80 ft.; no results; shot 20 qt. 6,300-10 ft., 1,000 ft. mud, no oil; S.D.O.

Gibson & Jenning's No. 1 Holt, NW cor. Blk. 36, Kaufman C.S.L. Sur. Loc.

W. B. Omohundro's No. 1 Seay, Sec. 32, Blk. 4, H.&T.C. Sur. (5,500-ft. test). Cong. 5,696-5,705 ft.; L. & cong. S.O. 5,686-5,706 ft.; rny. 6⅝-in.; filled up and flwd. oil on 30-min. D.S.T.; 6⅝-in. 5,289 ft.; sat. cong. 5,689-5,706 ft.; drld. plug; washed down; flwd. by hds. and S.I. to move rig.

Stanolind O. & G. Co.'s No. 1 McCool, NW cor. Jacob Lenow Sur. (½-mi. W outpost to Rogers field). 9⅝-in. 5,233 ft.; W.O.C.; D.S.T. 5,236-55 ft.; flwd. 345 bbl., 3 hrs.; ¾-in. ck.

Wichita County

E. C. Harlin, Jr., et al's No. 1 I. H. Kemner, SE cor. Blk. 28, Lge. 1, Denton Co. Sch. Lds. (5,200-ft. test). Drlg. 3,522 ft.

Wilbarger County

Amerada Pet. Corp.'s No. 1 B. Goodpasture, Sec. 35, H.&T.C. Sur., Blk. 15, 8,000-ft. test. M.I.M.

Young County

F. T. Conner's No. 1 Wright McClatchey est., SW cor. Sec. 284, T.E.&L. Sur. Drlg. 1,791 ft.

A. T. Strong et al's No. 1 E. C. Stovall, Sec. 2946, T.E.&L. Sur. (4,800-ft. test). Drlg. 4,790 ft.

James Toughy et al's No. 1-C Akers, W. McClure Sur., Abst. 183. S.S.G. 3,994-4,005 ft.; S.O. 4,005-20 ft.; est. 4,000,000 cu. ft. gas; tstg.

Rocky Mountain Runs

Production estimates for week ended March 16:

WYOMING

	Barrels
Salt Creek	14,080
Badger basin	170
Big Muddy	1,150
Byron	1,610
Cody dome	60
Cole Creek	180
Dallas Derby	470
Dewey dome	10
Elk basin	660
Frannie	1,380
Garland	3,280
Grass Creek	1,700
Hidden dome	50
Hudson	230
La Barge	1,080
Lance Creek	23,990
Lost Soldier	1,820
Mahoney	260
Medicine Bow	780
Mule Creek	200
Oregon basin	3,750
Osage	600
Quealy dome	580
Rock River	2,860
Teapot	20
Warm Springs	80
Wertz	3,960
Total Wyoming	65,020

MONTANA

Border	20
Cat Creek	480
Cut Bank	10,590
Dry Creek	730
Pondera	800
Kevin-Sunburst	4,320
Total Montana	16,940

COLORADO

Iles dome	1,750
Florence	120
Fort Collins and Wellington	400
Wilson Creek	540
Moffatt	400
Orchard	30
Rangely	90
Tow Creek	160
Price	510
Total Colorado	4,000

NEW MEXICO

Cooper	3,250
Corbin	30
Eaves	720
West Eunice	240
Eunice	20,400
Halfway	140
Hardy	3,410
Hobbs	11,370
Jal	610
Langlie	5,020
Lynch	400
Lynn	780
Mattix	5,190
Monument	20,870
North Lynch	20
Penrose	4,260
Rhoades	50
Skaggs	20
Skelly	1,040
South Eunice	4,120
South Lovington	1,630
Vacuum	12,550
Artesia-Maljamar	16,040
Aztec-Bloomfield	10
Getty	100
Hogback	200
Rattlesnake	560
Table Mesa	100
Total New Mexico	113,820
Total Rocky Mountain region	199,780

Canadian Fields

Completions and Operations in Northwest and in Ontario

By VICTOR LAURISTON

CHATHAM, Ont., Mar. 16.—The latest schedule of Turner Valley crude allowables, effective March 5, reduced the output of the field from 17,500 to 15,000 bbl. a day. The reduction is temporary and due to a fire in the Regina refinery of Imperial Oil, Ltd., which will prevent the plant operating to capacity for about 30 days. At the end of this period an increased allowable is expected.

The latest schedule lists 100 crude producers. Following publication of the list an increase was made in the quota of Anglo-Canadian Oil Co.'s No. 7, LSD 9, Section 31-18-2w5, from 312 to 352 bbl., making it the largest producer. Home Oil Co.'s No. 2 Millarville ranks second with 329 bbl. Other major producers are Royalite Oil Co.'s No. 46, with 296 bbl.; South West Petroleum Co.'s No. 3, with 290 bbl.; Royalite's No. 43, with 265 bbl.; Anglo-Canadian's No. 6, with 261 bbl.; and Royalite's No. 36, with 251 bbl. Home Oil Co.'s Nos. 3 and 4, North Turner Valley, were given temporary allowables of 250 bbl. Anglo-Canadian's No. 7, now the largest producer, yielded at the rate of 2,162 bbl. a day on a 6-hour test through 1-in. choke.

Turner Valley Completions

In Section 8-19-2w5, West Central Turner Valley, South West Petroleum Co.'s No. 3, LSD 3, finished at 7,167 ft. after drilling 447 ft. of limestone, tested 2,402 bbl. on 1-in. choke, and was given an allowable of 364 bbl., making it the third largest well in the field. Temporary allowable had previously been set at 300 bbl.

In North Turner Valley, Home Oil Co.'s No. 3, LSD 1, Section 33-20-3w5, finished at 8,311 ft., 623 ft. in the Madison, is being given systematic acid treatments in both upper and lower porous zones. Initial acidization of the lower horizon gave 33 bbl. an hour, compared with 23 bbl. in Home's No. 4, and final tests for allowable will shortly be completed. Gas from Nos. 2 and 4 was used to bring in No. 3. Home's No. 4 working under 300 bbl. temporary allowable, and final test for official allowable will not be made till No. 3 is completed.

Tests in the Lime

In West Central Turner Valley Anglo-Canadian Oil Co.'s No. 8, Section 7-19-2w5, which has been operating on an allowable of 25 bbl., is showing some improvement in production.

In Section 5-19-2w5 Vanpeg Royalties' No. 1, LSD 9, finished at 7,070 ft., 10 ft. in the black lime, is acidizing and testing production, with indications of a good well.

In Section 13-19-3w5 Arrow's No. 1, LSD 16, is below 7,906 ft. after getting the Madison at 7,620 ft. It is expected to finish around 8,080 ft. The upper lime showed 90 ft. of porosity. Location is somewhat west of the proven field, and production at this point would open a large new area to drilling.

In North Turner Valley Home Oil Co.'s No. 3, LSD 1, Section 33-20-3w5, drilled 623 ft. into the lime at 8,311 ft., is completing production tests. As soon as it is finished final tests will be made of Home's No. 4, LSD 9, Section 28-20-3w5, finished at 8,332 ft. Both wells are operating under 250 bbl. each temporary allowable.

West Central Field

In Section 18-19-2w5, West Central Turner Valley, Davies Petroleums' No. 3, LSD 10, is below 6,208 ft. after getting the Blairmore formation at 5,520 ft. Calmont-Northwest's No. 1, LSD 3, is below 5,941 ft. and getting close to the Blairmore.

In Section 6-19-2w5 East Crest Oil Co.'s No. 5, LSD 9, is below 7,134 ft. after getting the Dalhousie sand at 7,000 ft. It will probably be the next test to get the Madison. Kamalta Oils' No. 1, LSD 1, is below 5,905 ft.

In Section 5-19-2w5 Royalite's No. 51, LSD 13, is below 1,585 ft.

West Side Drilling

In Section 32-18-2w5 Royal Canadian Oil Co.'s No. 4, LSD 12, is below 5,950 ft. In Section 20-18-2w5 Tork Oils' No. 3, LSD 3, is in the Blairmore formation below 6,258 ft. In Section 8-18-2w5 Northwest-Hudson's Bay Co.'s No. 3, LSD 15, is in the lower Benton formation below 5,945 ft.

North Turner Valley

In Section 15-20-3w5, North Turner Valley, Anglo-Phillips' No. 1, LSD 14, is in the Blairmore formation below 7,113 ft. In Section 27-20-3w5 Foothills Oil & Gas Co.'s No. 6, LSD 5, is below 4,105 ft. after getting the Jumping Pound sands at 3,480 ft.

In Section 34-20-3w5 Alberta Oil Incomes' No. 1, LSD 4, is in the Blairmore formation below 5,637 ft. Alberta's No. 2, LSD 4, Section 4-21-3w5, is in the lower Benton below 3,942 ft. after getting the cardium sandstone marker at 3,140 ft. Both these tests, which are north of the Home producers, are logging higher than wells farther south. Alberta's No. 3 has been definitely located in LSD 5, Section 4-21-3w5, immediately north of No. 2, and will probably start work early in the spring.

Arrangements are being made for a test on acreage in Section 34-20-3w5, in which Vanalta Oils, Ltd., and Wales Petroleum, Ltd., are jointly interested.

Waite Valley Test

In the Waite Valley area, west of the North Turner Valley producers, National Petroleum Corp.'s No. 3, LSD 4, Section 25-20-4w5, encountered a repetition of the crooked-hole sand at 7,050 ft. after drilling into the Kootenay formation. It first got the Dalhousie sand at 6,630 ft. and on deepening reentered the Dalhousie at 7,114 ft., indicating the lime would be found around 7,625 ft. Similar repetitions have been encountered in North Turner Valley wells, Home's No. 2 getting the Dalhousie at 7,450 ft. and the lime at 8,032 ft., while Royalite's No. 43 got the crooked-hole sand first at 6,850 ft. with a repetition at 7,410 ft. and the lime at 8,200 ft. National's No. 3 has pulled 5⅞-in. casing and run 4½-in. to 7,000 ft. in order to speed drilling. Previous tests in the Waite Valley area were abandoned when the formations were repeated at depth, but later experience in the Turner Valley crude areas has shown that in a number of such instances a little deeper drilling has secured production.

Steveville Wild Gasser

In the Steveville field, 120 miles east of Calgary, Standard of British Columbia's No. 1 Princess, LSD 13, Section 22-20-12w4, standing in the Devonian limestone at 5,254 ft., blew out of control after attempts to shut it in, and wrecked the derrick. The test several weeks ago encountered a gas flow estimated between 30,000,000 and 40,000,000 cu. ft. a day, with some oil. Efforts were made to shut off the flow by the use of Baroid mud and other devices, in order to drill deeper for oil, and a master gate was installed. After being practically shut off for several days the accumulated pressure broke loose, hurling a heavy drill collar high in the air and wrecking the steel derrick. Three drillers were injured, Lloyd Johnson suffering a broken leg, bruises, and shock; William Marshall, a head gash, and Riley Austin a crushed right hand. They were taken to Bassano Hospital.

The gas flow, still blowing wide open, is estimated as high as 60,000,000 cu. ft. a day, carrying with it some vaporized oil. Workmen are clearing the wreckage. A new steel drrick will be erected and steps taken to kill the flow in order to drill deeper.

The test is the first to be drilled by Standard Oil Co. of British Columbia in the Alberta fields, and the first to get production from the Devonian limestone in the Steveville area. Three previous tests by Anglo-Canadian Oil Co. at widely separated points secured gas production, estimated around 7,000,000 to 12,000,000 cu. ft. a day, at the Madison lime contact.

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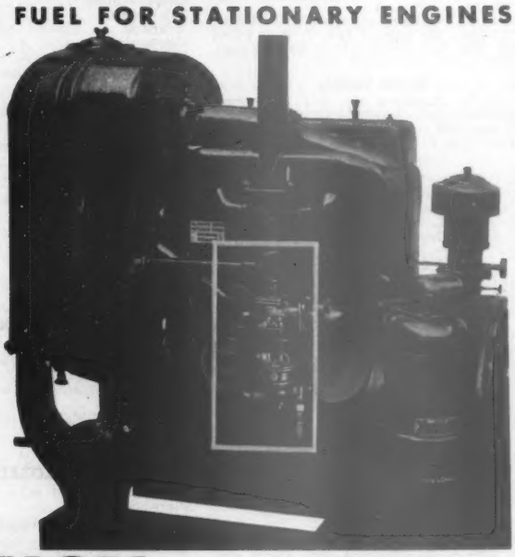

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INTERNATIONAL PETROLEUM EXPOSITION TULSA MAY 18-25

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Sensational Gain in Demand For Fuel Oils and Kerosene

ALMOST every state declined in output in January, the notable exceptions being Illinois, Louisiana, and Mississippi, according to the Bureau of Mines report for January. Illinois' daily production rose about 25,000 bbl. over December to a new peak of 371,000 bbl. in January. Oklahoma and Texas showed material declines, but California's output continued steady at just about 600,000 bbl. In the past year or so the variation between California's high and low has hardly exceeded 2 per cent.

Crude runs to stills were 3,436,000 bbl., or 22,000 bbl. higher than in December. This gain in refinery runs, combined with the temporary lull in output, was reflected in crude stocks, which increased less than 1,000,000 bbl., compared with a gain of more than 4,000,000 bbl. in December.

The indicated domestic demand for motor fuel opened the new year somewhat higher than anticipated, but exports continued to drop rapidly. The domestic demand was 40,370,000 bbl., or 7 per cent above a year ago; exports were 2,274,000 bbl., off 37 per cent from a year ago. In spite of the decline in yield and the satisfactory home demand, gasoline stocks rose about 7,500,000 bbl. in the finished grades and another 500,000 bbl. in unfinished. The total for the two on January 31 was 90,975,000 bbl., or about 11,500,000 bbl. more than on hand a year ago.

The yield of gasoline, which had been giving ground slowly in favor of heating oils, declined materially in January and fell to 42.9 per cent, compared with 45 per cent in December and 44.8 per cent in January 1939. The yield of gas oil and distillate fuel rose from 13.6 per cent in December to 15.5 per cent in January, residual fuel from 25.5 to 26.4.

The domestic demand for the fuel oils was sensational, kerosene being 31 per cent above last year, gas oil and distillate fuel up 34 per cent, and residual fuel oil up 13 per cent.

According to the Bureau of Labor Statistics, the price index for petroleum products in January 1940 was 51.7, compared with 52.5 in December 1939, and 50.4 in January 1939.

United States Supply and Demand

1940-1939

Crude Oil (Bbl.)

JANUARY—	TOTAL SUPPLY	TOTAL DEMAND	EXCESS DEMAND	EXCESS PCT.	DOMESTIC PRODUCTION	IMPORTS	INDICATED DOMESTIC DEMAND‡	EXPORTS	STOCKS REFINABLE CRUDE JAN. 31
1940	115,090,000	114,151,000	*939,000	*0.8	113,140,000	1,950,000	109,949,000	4,202,000	‖239,794,000
Daily average	3,712,000	3,682,000			3,650,000	63,000	3,547,000	136,000	
1939	116,678,000	105,683,000	*10,995,000	*10.4	114,810,000	1,868,000	101,206,000	4,477,000	272,346,000
Daily average	3,764,000	3,409,000			3,704,000	60,000	3,265,000	144,000	
Increase, 1940	†1,588,000	8,468,000			†1,670,000	82,000	8,743,000	†275,000	†32,552,000
	†1.4%	8.0%			†1.5%	4.4%	8.6%	†8.1%	†11.9%

Refinery Products Motor Fuel (Bbl.)

JANUARY—	TOTAL SUPPLY	TOTAL DEMAND	EXCESS DEMAND	EXCESS PCT.	DOMESTIC PRODUCTION	IMPORTS	DOMESTIC DEMAND	EXPORTS	STOCKS JAN. 31§
1940	50,261,000	42,644,000	*7,617,000	*18.0	50,243,000	18,000	40,370,000	2,274,000	84,863,000
Daily average	1,621,581	1,375,000			1,621,000	581	1,302,000	73,000	
1939	49,120,000	41,405,000	*7,715,000	*18.6	49,120,000		37,767,000	3,638,000	78,494,000
Daily average	1,585,000	1,336,000			1,585,000		1,221,000	117,000	
Increase, 1940	1,141,000	1,239,000			1,123,000		2,603,000	†1,364,000	6,369,000
	2.3%	4.0%			2.3%		7.0%	†37.5%	8.0%

Kerosene

1940	5,375,000	8,033,000	2,658,000	33.1	5,375,000		7,842,000	191,000	4,918,000
1939	5,702,000	6,790,000	1,088,000	16.5	5,702,000		5,980,000	810,000	6,711,000
Increase, 1940	†327,000	1,243,000			†327,000		1,862,000	†619,000	†1,793,000
	†5.7%	18.3%			†5.7%		31.1%	†76.4%	†26.7%

Gas Oil and Residual Fuel Oil¶

1940	46,556,000	57,623,000	11,067,000	19.2	44,630,000	1,926,000	54,935,000	2,688,000	115,743,000
1939	40,892,000	48,451,000	7,568,000	15.6	39,935,000	957,000	45,406,000	3,045,000	132,011,000
Increase, 1940	5,664,000	9,177,000			4,695,000	969,000	9,529,000	†357,000	†16,268,000
	13.8%	19.0%			11.8%	101.2%	21.0%	†11.7%	†12.3%

Gas Oil and Distillate Fuels

1940	16,592,000	24,336,000	7,744,000	31.8	16,548,000	44,000	22,787,000	1,549,000	26,462,000
1939	14,135,000	18,638,000	4,503,000	24.1	14,135,000		16,963,000	1,675,000	32,300,000
Increase, 1940	2,457,000	5,698,000			2,413,000		5,824,000	†126,000	†5,838,000
	17.4%	30.6%			17.1%		34.3%	†7.5%	†18.1%

Residual Fuel Oils

1940	29,964,000	33,287,000	3,323,000	10.0	28,082,000	1,882,000	32,148,000	1,139,000	89,281,000
1939	26,757,000	29,822,000	3,065,000	10.3	25,800,000	957,000	28,443,000	1,379,000	99,711,000
Increase, 1940	3,207,000	3,465,000			2,282,000	925,000	3,705,000	†240,000	†10,430,000
	12.0%	11.7%			8.8%	96.6%	13.0%	†17.3%	†10.5%

Lubricating Oils

1940	3,308,000	3,122,000	*186,000	*6.0	3,308,000		2,054,000	1,068,000	7,328,000
1939	2,527,000	2,460,000	*67,000	*2.7	2,527,000		1,609,000	851,000	7,762,000
Increase, 1940	781,000	662,000			781,000		445,000	217,000	†434,000
	30.9%	27.0%			30.9%		27.6%	25.5%	†5.6%

Petroleum Wax (Lb.)

1940	55,256,000	56,329,000	1,073,000	2.0	48,440,000	6,816,000	35,187,000	21,142,000	74,575,000
1939	38,271,000	38,984,000	713,000	1.9	35,280,000	2,991,000	20,642,000	18,342,000	128,627,000
Increase, 1940	16,985,000	17,345,000			13,160,000	3,825,000	14,545,000	2,800,000	†54,052,000
	44.5%	44.5%			37.3%	128.0%	70.5%	15.2%	†42.0%

*Excess supply. †Decrease. ‡Crude only. §Includes finished and unfinished refinery gasoline and natural gasolines. ¶Gas oil and fuel oil equals gas oil and distillate fuels plus residual fuel oils. Note: Total supply equals domestic production plus imports. Total demand equals domestic demand plus exports. Data on demand for refined products based on refinery shipments. ‖Does not include 13,385,000 bbl. of heavy oils in California. Comparable figure for Jan. 31, 1939, 16,356,000 bbl.

Crude Oil Run to Stills and Total All Oils (Bbl.)

JANUARY—	TOTAL IMPORTS‡	TOTAL EXPORTS‡	TOTAL CRUDE TO STILLS	PER CENT YIELD GASOLINE‡	NATURAL GASOLINE PRODUCTION	TOTAL SUPPLY ALL OILS*	TOTAL DEMAND ALL OILS*	STOCKS ALL OILS JAN. 31*
1940	4,712,000	10,728,000	106,530,000	42.9	4,271,000	122,395,000	126,719,000	520,446,000
Daily average	138,000	346,000	3,436,000	...	.....	3,948,000	4,088,000	.....
1939	3,525,000	12,971,000	99,614,000	44.8	4,264,000	110,464,000	111,454,000	566,056,000
Daily average	114,000	418,000	3,213,000	...	.....	3,563,000	3,595,000	.....
Increase, 1940	1,187,000	†2,243,000	6,916,000	...	7,000	11,931,000	15,265,000	†45,610,000
	33.6%	†17.3%	6.9%	...	0.2%	10.8%	13.7%	†8.1%

*Total all oils include crude and refined products, natural gasoline, and benzol. Stocks Jan. 31, 1940, represented 127 days' supply which compared to 157 days on the same date in 1939. †Decrease. ‡Does not include natural gasoline blended at refineries. §Includes crude oil and refinery products. In case of imports includes receipts in bond and for domestic use. All data based on Bureau of Mines reports.

Two Good Woodruff Sand Sections Found in Tinsley

By GEORGE WEBER

JACKSON, Miss., Mar. 18.—The Tinsley field in Yazoo County figured prominently in the week's interest in Mississippi. With two good Woodruff sand sections in northwest edge wells, one the best yet found in the section, and a test of heavy oil reported in the Tuscaloosa in another test, the field's importance was considerably enhanced.

Wildcatting in the state continued to increase with the beginning of four new tests in Copiah, Holmes, Madison and Wayne counties. Leasing, excepting in the vicinity of proposed wildcats and geophysical prospects, has fallen off perceptibly, and many of the leasing interests which entered the state with the general influx last autumn have left to follow plays in recent discoveries in Oklahoma, Arkansas and Texas. Geophysical prospecting continues strong, however, much of it being employed in surveying assembled blocks on exploration options. About 69 crews are active in Mississippi and 9 in Alabama.

A development of considerable importance to Tinsley this week was the coring of the best Woodruff sand section yet found in a ½-mile northwest extension well, Slick-Urschel Oil Co.'s No. 1 Slick, NE cor. NW Section 11-10-3. The well was drilled to a total depth of 4,647 ft. and an electrical log showed Woodruff oil sand from 4,539-90 ft., a lime and shale break at 4,590-95 ft., and more sand from 4,595-4,610 ft. From 4,610-40 ft. shale was cored. A core taken at 4,553-64 ft. showed the best looking sand found in any Tinsley well to date, and the thickness of the section indicates the well should surpass all previous ones in production. A string of 6-in. casing was set at 4,642 ft. and operators were expected to complete the well early this week.

Two locations south of this test, Union Producing Co.'s No. 1 Herron, a west edge well, topped the Woodruff sand at 4,440 ft., and has an estimated overall section of the sand of 102 ft., possibly including shale breaks, as indicated in the Slick well. Bottomed at 4,557 ft., the well has 7-in. casing set for early completion. These two wells have shown probably the most important development in the field since its discovery, and may reveal production to the northwest which will constitute major oil reserves.

Adding to interest in the field is a test of heavy oil in what is reported to be the Tuscaloosa formation, heretofore nonproductive at Tinsley. Union Producing Co.'s No. 4 Perry, which missed the Woodruff sand after cutting a fault at 4,692 ft., encountered the Stevens sand at 4,886-4,900 ft. A drill-stem test attempted last week failed when the seat did not hold. Two additional sands in the Eutaw formation, at 4,944-63 ft., also termed the Stevens, and a stray sand at 4,976-93 ft. were cored. A drill-stem test in the latter sand at 4,970-5,080 ft. showed recovery of 2,100 ft. of salt water and drilling mud cut with oil in 10 minutes, using ⅝-in. chokes top and bottom.

A core taken at 5,570-90 ft., showing recovery of 16 ft. and consisting of 3 ft. of sandy shale, 6 in. of sand showing heavy oil, and 7 ft. of red and gray shale. A drill-stem test of this section, taken at 5,545-90 ft. using ⅝-in. chokes top and bottom, showed recovery of 560 ft. of heavy oil and 720 ft. of oil and salt water in 10 minutes, with a top working pressure of 2½ lb. and a bottom-hole pressure of 500 lb. The test is shut down awaiting orders. This is a south-edge test.

One completion, bringing the field's total to 27 wells, was Hassie Hunt's No. 1 A. G. Johnson in Section 14-10-3, a west-edge operation completed in a stray sand in the Eutaw formation. A north-end operation, Jones & O'Brien's No. 1-C Stevens, was temporarily abandoned this week following failure to sidetrack and directional drill to the Woodruff sand. The test cut a fault and missed both the Woodruff and Stevens sands, and several attempts to drill directionally to the sand resulted in either drilling into the old hole or to too great an offset. The hole was plugged at 1,700-1,500 ft. and the rig moved off.

Interest in new wildcat operations is extended over several counties, mainly in Central Mississippi. S. J. Wheeless'

(Continued on Page 127)

MISSISSIPPI

Attala County

F. R. Jackson's No. 1 Federal Land Bank, 410 ft. S, 620 ft. E NW cor. NW SE Sec. 29-16n-9e. Drk.

Kosciusko Oil Co.'s No. 1 Jones, 600 ft. NW cor. Sec. 5-15n-9e. Loc.

P. & M. Oil Co.'s No. 1 J. A. McMillin, 300 ft. SW cor. SE SE Sec. 26-13n-5e. Drk.; selling spreads.

Choctaw County

Garland Anthony et al's No. 1 Ballard, SE cor. Sec. 8-18n-1e. T.D. 22 ft.; S.D.

Clarke County

Ark.-Miss. Oil Co.'s No. 1 State, C SE SE Sec. 16-2n-16e. Drk.

Copiah County

G. C. Koch's (former Triangle Drilling Co.) No. 1 W. W. Broome, 153 ft. SW cor. SW SE Sec. 1-10n-8e. Drlg. 706 ft.

S. J. Wheeless' No. 1 Columbia Mutual Life Ins. Co., C NE NE Sec. 19-1n-3w. M.I.M.

Hinds County

Crescent Oil Mill's No. 1 fee, E side Mill St., fire zone No. 3, City of Jackson, Sec. 3-5-1e. Set 8⅝-in. csg. 822 ft.; Set 5½-in. csg. on bttm.; drld. out to 2,468 ft.; reported tested 50,000 cu. ft. gas and water; T.D. 2,468 ft.; dpnd. to 2,470 ft.; S.W. incr.; tools moved out; S.D.; W.O.; H.F.W.

Holmes County

Allied Pipe Line Co.'s No. 1 Ellis, C NE SW Sec. 18-14n-4e. M.I.R.

Issaquena County

W. E. Hall's No. 1 Irby Charping, approx. C NE NW Sec. 29-10n-8w. M.I. rig.

Locke & Mellard's No. 1 W. Gary, 660 ft. SE cor. NW¼ Sec. 14-9n-6w. Loc.

Tatum, Dunbar & Shaddock's (Germany, Lucy & Fair) No. 1 Mohanna, E½ SW Sec. 9-18n-3e. Set 18-in. csg. 20 ft.; recmtd. 10¾-in. csg. 600 ft.; T. chalk (ctgs.) 4,670 ft.; T. Tuscaloosa 5,490 ft.; cg. 5,531 ft.

Itawamba County

G. C. Grasty et al's No. 1 Ky. Lbr. Co., 1,320 ft. E, 660 ft. S, C Sec. 7-10s-10e. Twisted off D.S.; skd. 24 ft. S and spd.; set 10¾-in. csg. 170 ft.; S.O. 1,500 ft.; T. Trenton L. 1,600 ft.; drlg. sdy. L. 2,462 ft.

Kemper County

M. R. Crabb et al's No. 1 W. T. Caldwell, NW SE Sec. 25-9n-15w. 10¾-in. csg. 86 ft.; set 6-in. csg. 1,320 ft.; T.D. 1,640 ft.; acid. with 1,000 gal.; S.D.; W.O.

Lamar County

Miss.-La. Oil Synd.'s No. 1 Simmons, 1,020 ft. N, 56 ft. W, SE cor. NE¼ Sec. 32-3n-14w. S.D. 920 ft. (cor. T.D.).

Madison County

E. L. Foster's No. 1 Haffey, NE cor. S½ Lot 5, Sec. 8-10n-5e. M.I. drk.

Ryan & Anderson's No. 1 Parkinson, C NW NE Sec. 23-9n-1w. Spd.

Ralph A. Johnston's No. 1 Ray & Dinkins, C SW SW Sec. 14-10e-3w. Loc.

Monroe County

Willmut G. & O. Co.'s No. 1 Roberts, NW¼ Sec. 18-13s-17w. D.S.T. 2,410-30 ft.; Amory gas zone, dry; S.G. 2,844-52 ft.; hard cmtd. sd., odor oil 2,821-72 ft.; D.S.T., no results; ran Schlumberger and set 7-in. csg. 2,810 ft.; T.D. 2,879 ft.; flwd. small amt. gas and bailed to bttm.; shut in and opened well intermittently; no pressure inc.; prep. shoot sd. section; S.D.; W.O.

Pike County

S. R. Crouch's No. 1 Cupit, 360 ft. N, 660 ft. W, SE cor. NE SW Sec. 25-2n-7e. Set 6-in. csg. 729 ft.; S.D. 2,390 ft.

Prentiss County

Home Dev. Co.'s No. 1 Mrs. A. Allen, Sec. 8-7s-9e. S.D. 1,630 ft.

Sharkey County

Eureka Pet. Co.'s No. 1 W. H. Cooper, 1,980 ft. S, 660 ft. W, NE cor. Sec. 13-14n-6w. Set 10¾-in. csg. 571 ft.; T.D. 1,100 ft.; S.D.

Simpson County

Cleve Love et al's No. 1 N. E. Garner, 300 ft. N and E of C Sec. 1-10n-17w. O.W.D.D.; O.T.D. 3,145 ft.; set 10¾-in. csg. 871 ft.; T.D. 5,191 ft.; recmtd. surf. csg.; W.O.C.

Warren County

W. O. Allen's No. 1 J. W. Culley, 1,980 ft. NW cor. NW¼ Sec. 6-13n-3e. Set 10¾-in. csg. 983 ft.; drlg. sh. 3,721 ft.

H. C. Cummings et al's No. 1 T. H. Morrissey, C E½ W½ NE Sec. 8-17n-2e. Spd. and S.D. 20 ft.; prep. resume drlg.

Wayne County

Hill & Hill and W. L. Stewart's No. 1 Kalmia Realty Co., C SW NW Sec. 5-7n-9w. Spd.; S.D.; W.O. rig.

Yazoo County

Hill & Hill et al's No. 1 Kinkead Plantation, 1,796 ft. SE cor. NE¼ Sec. 31-11-3. 7⅝-in. csg. 128 ft.; T.D. 5,358 ft.; S.D. for repairs and couldn't get back in old hole; sdtrkd. at 450 ft.; T. Selma chk. 5,127 ft.; S.D.; prep, resume drlg.

Hassie Hunt's No. 2 A. G. Johnson, C SE NE Sec. 14-10-3. Set 16-in. csg. 80 ft.; T.D. 4,860 ft.; D.S.T. 4,835-60 ft.; ⅝-in. cks. top and bttm., rec. 1,738 ft. oil in 15 min.; W.P. 9½ lb.; arng. set 7-in. csg.

Hassie Hunt's No. 4 A. G. Johnson, C NE NW Sec. 14-10-3. M.I.M.

Hassie Hunt's No. 4 J. C. Johnson, C SW SE Sec. 11-10-3. M.I.M.

Edgar Johnson's No. 1-B Brumfield, C NW SW Sec. 1-10-3. Drlg. sh. and bldrs. 2,356 ft.

Kingwood Oil Co.'s No. 1 R. E. Wilburn, 330 ft. NE cor. Sec. 31-12n-3e. Drlg. 2,011 ft.

Robt. P. Lake's No. 1 Exum Est., C SW NE Sec. 13-11-2. T. Eutaw 4,810 ft.; cd. sdy. sh. 4,823-27 ft.; prep. core 4,967 ft.

J. R. Lockhart et al's No. 1 Frank Brooks, W½ SE NW Sec. 17-10-2w. T. chalk 4,964 ft.; T. sd. 5,047 ft.; cd. 5,051-55 ft.; cores rec. 5,047-51 and 5,110-25 ft.; showed salty taste; T.D. 5,134 ft.; (cor.); S.D.; resumed drlg. 5,286 ft.

Nelson Bros.' No. 1 S. S. Stoner, C SE NW Sec. 2-11-5w. M.I.M.

Slick-Urschel Oil Co.'s No. 1 Slick, 2,075 ft. S, 670 ft. W, NE cor. NW¼ Sec. 11-10-3. Woodruff sd. 4,539-90 ft.; L.&sh. break 4,590-95 ft.; sd. 4,595-4,610 ft.; sh. 4,610-40 ft.; set 6-in. csg. 4,642 ft.; W.O.C.

Slick-Urschel Oil Co.'s No. 2 Slick, 760 ft. N, 560 ft. W SE cor. SW Sec. 2-10-3. M.I.M.

Union Producing Co.'s No. 1 Geo. Herron, C NE SW Sec. 11-10-3. T.D. 4,557 ft.; Wdrf. sd. 4,440-4,542 ft.; arng. run 7-in. csg.

Union Prod. Co.'s No. 4 Perry, C SW NE Sec. 24-10-3. Set 16-in. csg. 50 ft.; Stevens sd. 4,886-4,906 ft.; Stevens sd. 4,944-63 ft.; stray sd. in Eutaw 4,976 ft.; D.S.T. 4,970-5,080 ft.; ⅝-in. cks. top and bttm.; rec. 2,100 ft. S.W. and drlg. mud cut with oil; cd. sd. in Tuscaloosa 5,570-90 ft. showing oil.; D.S.T. 5,545-90 ft., ⅝-in. cks. top and bttm., rec. 560 ft. heavy oil and 720 ft. oil and S.W. in 10 min.; S.D.; W.O.; T.D. 5,590 ft.

Union Prod. Co.'s No. 1 Stevens, C NW NW Sec. 13-10-3. O.W.W.O.; O.T.D. 6,112 ft.; P.B. 4,973 ft.; set 1st retainer 1,820 ft.; perf. 4,808-10 ft.; 2nd retainer 4,898 ft.; recomp. 750 B.P.D.; 50% S.W.; ¼-in. ck.; went dead; S.D.; W.O. S.R.

Union Producing Co.'s No. 5 Stevens, C SW NE Sec. 11-10-3. Spd.; set surf. csg.; W.O.C.

Union Prod. Co.'s No. 6 Stevens, C SW NE Sec. 12-10-3. Drlg. sh.&L. 3,816 ft.

Union Prod. Co.'s No. 8 Stevens, C NW NE Sec. 12-10-3. Drlg. lig. 3,742 ft.

Union Prod. Co.'s No. 5 Woodruff, C SW SW Sec. 13-10-3. M.I.M.

Union Prod. Co.'s No. 6 Woodruff, C SW NW Sec. 13-10-3. Set 16-in. csg. 67 ft., 10¾-in. csg. 1,213 ft.; Woodruff sd. 4,497-4,502 ft.; D.S.T. 4,492-4,532 ft.; rec. 880 ft. oil in 10 min.; drlg. Stevens sd. 4,859-72 ft.; tstd. S.W.; T.D. 4,931 ft.; P.B. 4,550 ft.; set 5½-in. csg. 4,548 ft.; perf. 4,493-4,506 ft.; ran tbg.; swbg. perf. 4,493-4,506 ft.; swbd. 8 hrs. and rec. 98 bbl. oil; would not kick off; S.D.;

ALABAMA

Mobile County

W. L. McClanahan's No. 1 J. A. Stafford, 300 ft. N, 150 ft. W SE cor. NW SW Sec. 24-7s-3w. Spdd.

FLORIDA

Dade County

Wm. G. Blanchard et al's No. 1 Everglades, 200 ft. E, 100 ft. N, SE cor. Sec. 31-53s-35e. Set 16-in. csg. 140 ft.; drlg. L.&sh. 1,328 ft.

Levy County

Florida Oil Discovery Co.'s No. 2 Cedar Key, SW SW NE Sec. 9-15s-13e. T.D. 5,266 ft.; S.D. 4,150-79 ft.; set 4-in. csg. 4,230 ft.; perf. 4,150-79 ft.; ran tbg. and swbd. slight trace oil and S.G.; bailing S.W.; prep. perf. csg. 4,119-32 ft.

Harkey & Houck's No. 1 Crapps, Sec. 15-14s-17e. T.D. 900 ft.; no reports.

Nassau County

St. Mary's River Oil Corp.'s No. 1 Hillard Turpentine Co., NW cor. NW SE Sec. 19-4n-24e. Reported S.O. 4,795-4,810 ft.; S.D. 4,814 ft. T.D.

Suwannee County

Wm. G. Blanchard et al's No. 1 Lucy Cotton, 774 ft. N, 153 ft. W, SE cor. NE¼ Sec. 35-3s-11e. S.D. 184 ft.

J. W. Phillips Oil Explrn. Co.'s No. 1 Shilkett, NW NW Sec. 14-4s-14e. S.D. cor. T.D. 369 ft.

GEORGIA

Clinch County

Georgia Resources, Inc.'s No. 1 Gillican, C Land Lot 200, 12th Land Dist. Set 10-in. csg. 736 ft.

Montgomery County

E. O. Moses' No. 3 Montgomery, SW R.R. station, Uvalda Sur. Drlg. sh. 750 ft.; no report.

CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

Complete crude-price schedules are now being published in the first issue of each month. The last complete schedule was published in the March 7 issue. All changes in crude-oil-price schedules will be published completely in the first issues following the announcement of the changes. Following are representative crude-price schedules in barrels (42 gal.):

East Texas	$1.10
Conroe	1.27
Tepetate, Louisiana	1.03
Smackover, Arkansas, heavy	.73
Illinois basin	1.05
Pecos County, Texas	.78
Lance Creek, Wyoming	.77
Bradford, Pennsylvania	2.75

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

	Signal Hill, California*	Oklahoma, Kansas	Gulf Coast Texas
14-14.9	$.065	....	....
15-15.9	.65	....	....
16-16.9	.65	....	....
17-17.9	.65	....	....
18-18.9	.65	....	....
19-19.9	.69	....	$0.86
20-20.9	.73	$0.70	.88
21-21.9	.78	.72	.90
22-22.9	.82	.74	.92
23-23.9	.86	.76	.94
24-24.9	.90	.78	.96
25-25.9	.95	.80	.98
26-26.9	.99	.82	1.00
27-27.9	1.03	.84	1.02
28-28.9	1.07	.86	1.04
29-29.9	1.10	.88	1.06
30-30.9	1.14	.90	1.08
31-31.9	....	.92	1.10
32-32.9	....	.94	1.12
33-33.9	....	.96	1.14
34-34.9	....	.98	1.16
35-35.9	....	1.00	1.18
36-36.9	....	1.02	1.20
37-37.9	....	1.04	1.22
38-38.9	....	1.06	1.24
39-39.9	....	1.08	1.26
40-40.9	....	1.10	1.28

*Effective February 1, 1940.

Crude-Oil Prices

Effective March 15 Standard Oil Co. of Louisiana withdrew its posting of crude-oil price in the University field in coastal Louisiana.

Market Record of Active Oil Stocks

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1940 High	1940 Low	Week ended Mar. 16 High	Week ended Mar. 16 Low	Week ended Mar. 16 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1938	Com. sh. earn. 1937	1939 High	1939 Low	1938 High	1938 Low
56½	53⅛	54⅝	53⅛	53⅛	Amerada Corp.	788,675	N.P.	50cQ	1-31-40	$2.00	$2.07	$3.04	74½	50	78	55
23⅝	20½	23⅜	22⅝	22⅝	Atlantic Refining	2,663,999	$25	25cQ	3-15-40	1.00	1.40	3.51	24¾	18⅛	27⅜	17⅜
15¾	13¾	15¼	14	14	Barber Asphalt Co.	390,223	$10	25c	2-20-40	.25	—.85	1.91	21	10¼	23¾	12⅛
13⅜	10¾	11⅜	11	11	Barnsdall Oil Co.	2,250,344	$5	15c	3-9-40	.90	1.26	.85	19½	11⅛	21⅜	10⅛
8	7	7½	7¼	7¼	Consolidated Oil Corp.	13,751,846	N.P.	20cQ	2-15-40	.80	.55	1.48	9⅜	6⅛	10⅜	7
25	22½	23	22½	22½	Continental Oil of Delaware	4,682,581	$5	25cQ	3-25-40	1.00	1.10	2.98	31½	19⅞	35¾	21¼
6⅞	5½	5¾	5½	5½	Houston Oil	1,098,618	$25	....	10-17-30	....	.83	.94	9⅜	4½	9¾	5
13½	11¾	13⅛	13	13	Lion Oil Refining	435,815	N.P.	25cQ	12-23-39	1.00	2.09	2.17	18⅛	10	25⅛	15⅝
16⅜	13⅞	14½	14	14¼	Mid-Continent Petroleum	1,857,912	$10	35c	12-1-39	.60	.56	2.86	18	11⅛	22⅝	12¼
10⅝	9½	9¾	9½	9½	Mission Corporation	1,379,245	$10	40c	12-15-39	.65	1.04	1.31	14⅞	8¾	17¾	10⅝
9¾	8⅛	8⅞	8⅜	8⅜	National Supply	1,155,517	$10	....	12-22-37	....	—.79	4.90	15½	5⅝	23	12½
7⅝	6½	7⅛	6⅞	7⅛	Ohio Oil Co.	6,563,377	N.P.	20c	12-15-38	....	.25	1.30	10½	6	14⅞	8⅞
8¼	7¼	7½	7¼	7¼	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	.40	1.22	1.39	11⅞	7	15⅞	10¼
8	6¾	..	..	..	Pan American Pet. & Trans.	4,702,945	$5	....	12-31-37	....	.08	1.18	8¾	5	9¼	6¼
41¾	36½	39⅝	38½	38½	Phillips Petroleum	4,449,052	N.P.	50cQ	3-1-40	2.00	2.03	5.42	46½	31¼	44⅜	27¼
22¾	20½	22	21½	21½	Plymouth Oil Co.	1,006,200	$5	35cQ	3-30-40	$1.40	2.59	2.85	24	17⅛	25⅜	15
9¾	8⅛	9¾	8¾	9	Pure Oil Co.	3,982,031	N.P.	25c	12-20-39	.25	.38	2.15	11⅜	6⅛	13½	8¼
8⅜	6⅞	7⅛	6⅞	6⅞	Richfield Oil Corp.	4,010,000	N.P.	50c	12-18-39	.50	.51	.35	10¼	6⅝	9⅞	5
20	17⅞	18¼	17⅞	18	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	3-15-40	1.00	1.52	1.97	24⅜	15½	27½	15½
13⅛	10⅜	10⅞	10⅜	10½	Shell Union Oil	13,070,625	N.P.	25c	12-20-39	.50	.72	1.44	17¼	9⅞	18⅜	10
22¼	18½	20	18½	18½	Skelly Oil	995,349	$15	25c	1-30-40	.75	2.27	6.07	29½	15½	34⅜	18½
12½	11⅛	11⅜	11⅛	11¼	Socony-Vacuum	31,206,071	$15	25cSA	3-15-40	.50	1.29	1.82	15¼	10¼	16⅜	10⅜
26⅛	22⅝	23⅞	22⅝	22¾	Standard Oil of California	13,004,153	N.P.	25cQ	3-15-40	1.10	2.22	3.17	33⅝	24¼	34⅞	25⅛
27¾	25½	26½	25½	25⅝	Standard Oil (Indiana)	15,272,020	$25	25c	3-15-40	1.25	1.82	3.66	30	22¾	35½	24¾
46½	42¾	44⅜	43⅛	43¼	Standard Oil of New Jersey	26,618,065	$25	75c‖	12-15-39	‖1.25	2.86	5.64	53½	38	58⅜	39⅜
63⅜	56¼	61¼	61	61	Sun Oil	2,316,484	N.P.	25c•	3-15-40	1.00	1.07	3.86	66	45¾	65⅛	45
2½	2	2⅛	2	2	Superior Oil Corp.	1,388,979	$1	10c	12-28-38	....	.24	.32	3⅝	1¾	4¼	1¾
46⅞	42⅜	45⅝	44⅜	44⅞	Texas Corp.	10,876,882	$25	50cQ	4-1-40	2.00	2.13	5.02	50¾	32½	49⅝	32⅝
4⅛	3½	3⅜	3⅜	3⅜	Texas Gulf Producing Co.	888,146	N.P.	10c	12-15-39	.20	.86	.68	5¾	3¼	5⅞	2⅝
8⅝	7½	8¼	7⅞	7⅞	Texas Pacific Coal & Oil	888,236	$10	10c	12-1-39	.40	1.16	1.11	11⅜	7	12½	7
11⅛	10	10½	10⅛	10⅛	Tide Water Associated	6,375,253	$10	15c	3-1-40	.80	1.28	2.08	14¼	9½	15¾	10⅛
17½	16	16¼	16	16	Union Oil Co. of California	4,666,270	$25	25c	3-10-40	1.05	1.47	2.58	19⅜	15⅛	22½	17¼
27⅛	22¾	27⅛	26¼	27	Union Tank Car Co.	1,177,381	N.P.	40c†	3-1-40	1.30	1.16	1.70	24¼	20⅛	23½	20
3⅝	3⅛	..	..	..	Wilcox Oil & Gas	487,568	$5	10c	2-15-40	....	.52	.24	4¼	2⅝	3½	1⅝

•Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. §Also 4 per cent in stock. ‖Also 2½ per cent in stock. ¶Also 1½ per cent in stock. —Deficit.

New York Curb Exchange

1940 High	1940 Low	Week ended Mar. 16 High	Week ended Mar. 16 Low	Week ended Mar. 16 Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1939	Com. sh. earn. 1938	Com. sh. earn. 1937	1939 High	1939 Low	1938 High	1938 Low
8¼	6⅛	8¼	6¾	8	American Republics Corp.	1,308,049	$10	10c	7-11-38	....	—$0.22	$0.27	11¾	5½	11¾	5
3¼	2⅜	2⅞	2¾	2¾	Bridgeport Machine Co.	270,000	N.P.	$1.25	12-30-37	....	—.14	1.90	7¼	2½	10¼	4⅞
43	28	38½	37½	38	Buckeye Pipe Line Co.	200,000	$50	$1	3-15-40	$2.50	2.36	4.02	34¾	26½	39	22½
116	110	113⅜	113¼	113¼	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	3-29-40	6.00	5.32	6.73	130	108⅝	128	97
5⅛	4	5⅛	4¼	4½	Cities Service (new)	3,704,067	$10	....	6-1-32	....	.23	1.02	9¼	4¼	11	5⅛
1½	1⅛	1½	1⅜	1⅜	Cosden Petroleum	462,551	$1	....	.....	....	....	.19	2¼	½	2⅜	⅞
22⅜	19¾	21⅜	20¾	21	Creole Petroleum	6,975,383	$5	50cSA†	12-15-39	1.00	1.64	1.61	28	16¾	27½	17½
4⅜	4	4¼	4¼	4¼	Darby Petroleum	351,390	$5	25cSA	1-15-39	.25	....	1.36	7⅛	3⅝	10¼	5½
2	1⅝	1⅝	1⅝	1⅝	Derby Oil & Refining	263,162	N.P.	....	.....	....	—.91	1.34	2⅝	1½	3½	1½
27	23½	26	26	26	Eureka Pipe Line	50,000	$50	50c	2-1-40	2.00	—.37	—.12	23	15⅛	31	16
39⅞	34	36⅝	35	35	Gulf Oil Corp.	9,076,202	$25	25cQ	4-1-40	1.00	1.43	3.51	45⅛	29¼	46⅞	33
68	58	60¼	59⅜	59½	Humble Oil & Refining	8,987,840	N.P.	62½c	4-1-40	2.00	3.98	5.22	71	52½	72⅝	56
12⅜	11	11½	11	11	Imperial Oil of Canada	26,965,078	N.P.	37½c†	12-1-39	1.00	.96	.98	17	11⅜	19½	14⅛
6⅝	5¾	6½	6	6½	Indiana Pipe Line	300,000	$10	20c	11-15-39	.50	.47	1.03	7¼	5½	9⅜	6
19¾	17⅛	17¾	17⅛	17⅛	International Petroleum	14,324,088	N.P.	75c	12-1-39	1.75	1.98	....	27½	17	31¼	21
2¾	2¼	2½	2⅜	2½	Kirby Petroleum Co.	500,000	$1	10c	4-15-38	....	.14	.17	3¾	2⅛	5	2⅛
10⅜	9⅝	9⅞	9⅝	9¾	Lone Star Gas	5,553,747	N.P.	20c	4-22-40	.70	.88	1.14	10½	7⅛	10⅜	6⅝
6	5	5¼	5	5⅛	Louisiana Land & Exp.	2,977,449	$1	10c	3-15-40	.35	.45	.58	7⅜	4	9⅜	6½
15	11½	11½	11½	11½	Margay Oil Corp.	149,943	N.P.	25cQ	4-10-40	1.00	2.28	3.26	17	14½	24	16
8	7¼	7⅞	7¾	7¾	Midwest Oil Co.	998,474	$10	45c	12-15-39	.90	.93	1.14	8¾	6⅝	9⅜	6⅝
5⅜	5¼	5⅝	5⅝	5½	Mountain Producers	1,593,584	$10	30cSA	12-15-39	.60	.62	.76	6	4⅞	5⅜	4½
13⅛	12	12⅜	12¼	12½	National Fuel Gas	3,810,183	N.P.	25cQ	4-15-40	1.00	.84	.96	14	11¼	14⅝	11½
11⅛	8¾	11⅛	10¾	11	National Transit	509,000	$12.50	50c	12-15-39	.85	.88	1.19	9½	7¼	9¼	6½
1¼	1	1⅛	1	1⅛	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.02	.02	1⅜	1	2⅝	1⅛
6½	5¼	6½	6½	6½	New York Transit	100,000	$5	25c	4-15-40	.40	.16	.49	6	4	4½	3½
7⅜	6¾	7⅝	7⅜	7⅜	Northern Pipe Line	120,000	$10	15c	12-1-39	.30	.24	.78	7	4½	6	4
5½	4⅝	5½	5⅛	5⅛	Pantepec Oil	2,857,000	$1	....	.....	....	....	....	7⅝	4	7¾	3½
3¼	2¼	..	..	..	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.17	—.17	5	1¼	4½	1⅝
2¼	1⅞	2	2	2	Ryan Consolidated	298,931	N.P.	....	.....	....	.29	.46	3	1⅞	4	2⅛
7⅜	4⅞	..	..	..	Southern Pipe Line	100,000	$10	15c	3-1-40	.30	—.27	.85	4⅞	3½	5⅜	3¼
44	38⅝	39½	38	38	South Penn Oil	1,000,000	$25	37½c	3-29-40	3.00	1.44	4.64	40½	26¾	39	28⅝
35	22	27½	27½	27½	Southwest Penna. Pipe Lines	35,000	$50	$5	4-1-40	2.00	—.41	.95	23	18	22¼	16½
20⅞	20	20¾	20½	20½	Standard Oil of Kentucky	2,604,790	$10	25c	3-15-40	1.30	1.45	1.60	20¼	17¼	18⅜	15
37½	28¾	37	34½	34¾	Standard Oil of Ohio	753,740	$25	25c	3-15-40	1.50	1.81	3.67	32¾	17	22⅝	16¼
2	1¼	1⅞	1¾	1¾	Sunray Oil	2,007,076	$1	5c	5-1-40	.10	.23	.42	2¾	1¾	3¼	2
2¾	2½	2⅝	2⅝	2⅝	Texon Oil & Land	936,024	$2	10c	3-29-40	.10	.56	.51	4	2⅝	5¼	3½
3⅜	2⅜	2⅜	2⅜	2⅜	Transwestern Oil Co.	750,000	$10	....	.....	....	—.12	.48	6	2½	7⅝	4¼
2⅛	1⅝	1½	1⅝	1⅝	United Gas Corp.	7,818,959	$1	....	.....	....	—.51	.25	3⅜	1½	5¼	2⅝

†Includes extras. —Deficit.

Personal Paragraphs

E. A. HOLBEIN

E. A. HOLBEIN, vice president and director of Standard Oil Co. of New Jersey (Delaware), has been elected president of Standard Oil Co. of Pennsylvania succeeding C. G. SHEFFIELD who retired last year. Mr. Holbein has served the Standard company 41 years. JOHN J. WINTERBOTTOM has succeeded W. L. INSLEE as manager of Standard Oil Co. of New Jersey marine department's traffic division. C. B. MILLARD, assistant treasurer of the New Jersey company for 14 years, has relinquished this post to devote full time as trust officer of the annuity trust. HERBERT P. SCHOECK, who has served the company in various capacities in the treasurer's department, has been made assistant treasurer. ALEXANDER MILLIKEN, cashier since 1935, has retired. He joined the company in 1908. KURT H. QUICK has been made personnel manager of the home office in New York. He began as an office boy in the domestic sales department, became a junior clerk in 1920 in the office of WALTER C. TEAGLE and served in the statistical and other departments dealing with Latin American marketing.

M. L. ATKINSON, district superintendent, Phillips Petroleum Co., has been transferred from Seminole, Okla., to Odessa, Tex.

R. M. HURT, in charge of operations for International Petroleum Co. in Ecuador, South America, and Mrs. Hurt, who have been visiting her parents, Mr. and Mrs. J. J. Conry, in Tulsa, left last week for Ecuador.

FRANK PHILLIPS, chairman, Phillips Petroleum Co., will become a member of Delta Sigma Pi, international commerce fraternity, and the principal speaker at a banquet following the initiation ceremony at the University of Oklahoma April 4.

CHESTER A. THOMAS, district manager for the Southwest Natural Gas Co. at Holdenville, Okla., has been promoted to production superintendent in charge of the company's gas well drilling at Iberia, La. He has been with the company for 13 years, part of the time in Shreveport, La.

JOHN H. LOUDON, JR., assistant manager of the Caribbean Petroleum Co., in Caracas, Venezuela, sailed from New York March 15 en route to the South American office.

R. E. LUTON, general superintendent of refineries for Ohio Oil Co., Robinson, Ill., was in Fort Worth, Tex., last week checking the activities of the company's refinery in that city.

GUY S. CONNERS, superintendent, Williams Brothers Corp., was at the company's headquarters in Tulsa over the week end. In the course of construction of Southeastern Pipe Line Co.'s gasoline line in Florida and Georgia, he has moved his office from Albany, Ga., to Americus, Ga.

J. B. DUTTON and PAUL HUGHES sailed recently via Matson Line for New Zealand, where they are employed by the drilling division of the New Zealand Petroleum Co.

A. L. WATKINS, FRANK A. AKERS, J. P. ROACHE and JOHN C. DUNN left Los Angeles, Calif., for New York City where they will embark for Egypt in the service of the drilling department of Socony-Vacuum Oil Co., Inc.

DR. J. O. G. SANDERSON, petroleum geologist, of Calgary, Alta., was formally honored with the Barlow Memorial Medal at the annual meeting of the Canadian Institute of Mining and Metallurgy at Winnipeg. The medal was in recognition of the merits of his paper on the Brazeau oil structure presented at the Calgary meeting last fall.

GEORGE E. EDGETT, in charge of the gasoline division of the production department of Carter Oil Co., was completely surprised March 11 when, with a few words of congratulation, O. C. SCHORP, vice president and production department manager, presented to him his 30-year service button from the Standard Oil Co. (New Jersey). First hired July 1, 1900, for 3 months, Mr. Edgett was reemployed in 1910 in West Virginia. He recalls that John J. Carter, founder of the company, was a member of the school board operating the school he attended.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

In the general taxation bill before the Oklahoma Legislature the tax on crude-oil production is raised to 2 per cent. It is at present one-half of 1 per cent.

M. W. Wagner of Limestone, N. Y., and Bradford, Pa., on whose Limestone farm one of the first indications of oil in the Bradford field was discovered, dies after a long illness.

Rotary drilling is to be tried in the Buffalo basin, Wyoming, where high-pressure gas has made cable drilling difficult and hazardous.

20 YEARS AGO

Independent Pennsylvania Grade oil refiners who have been buying crude oil from the Joseph Seep purchasing division of the South Penn Oil Co., must do so hereafter through one agency. As a result 16 refiners have joined the agency, headed by S. S. Messer at Emlenton, who will be the official buyer for all the members.

Five teams of horses drawing wagons loaded with pipe staged a runaway through the business district of Big Heart, Osage County, Oklahoma. One teamster was killed. The cause of the general runaway is not given.

Frank Frantz, Oklahoma's last territorial governor, opens a high-gravity oil field in Fergus County, Montana. It is known as the Cat Creek field.

Woodburn Oil Co. sells 55,000 bbl. of Burkburnett, Tex., crude to a refiner at $4 per barrel or at 50 cents per barrel above the posted price.

10 YEARS AGO

James M. Guffey, noted wildcatter and discoverer of fields, and Democratic politician, died March 20 at Pittsburgh, Pa. He was a member of the firm of Guffey & Galey.

Oklahoma City field, with a potential rated at 1,000,000 bbl. per day, is held down to 64,000 bbl. per day.

FRED ZION, well-servicing foreman for Phillips Petroleum Co. in Seminole, Okla., has been promoted to the position of district superintendent in that area.

TOM CONGER, petroleum engineer with Standard Oil Co. of New Jersey in the Dutch East Indies, is spending part of his vacation in this country in Shreveport, La.

ROY CAMPBELL, formerly tool pusher for Noble Drilling Co., is now superintendent of drilling for Harvey H. Sims Drilling Co., with headquarters at Salem, Ill.

HERBERT YOHO, geologist of Byesville, Ohio, en route from Tulsa to Wichita Falls, was the victim of an armed robbery 5 miles north of the Burkburnett bridge across Red River.

S. D. BECHTEL and H. C. PRICE sailed from New York March 15 on the Santa Rosa en route to Caracas and Puerto la Cruz, Venezuela, in the interest of the Compania Constructora Bechtel-Price, S.A., which is doing considerable oil-field construction work in eastern Venezuela.

A. W. McPHERSON, A. E. CARPENTER and W. B. GOODWIN of California Arabian Standard Oil Co.; G. W. van BILDERBECK of N. V. de Bataafsche Petroleum Maatschappij, from The Hague; JOHN M. RUSSELL of Sarawak Oilfields, Ltd., Sarawak; K. B. JAUMAN of Attock Oil Co., Ltd., from Khaur, Punjab, India; and L. C. STEVENS of Caribbean Petroleum Co., Maracaibo, Venezuela, attended the March meeting of the Los Angeles chapter of the Nomads.

BRANTLEY JACKSON, Magnolia Petroleum Co. land man, has been transferred from Jackson, Miss., to the Forest City basin.

H. H. TEMPLE, D. D. DUNN, and MRS. J. W. WILLIAMS, of Texarkana, have incorporated the J. & J. Oil Co. of Texarkana.

E. B. SABIN, formerly with Pan American Production Co., Houston, Tex., has gone to New Zealand as mud control engineer for New Zealand Petroleum Co., Ltd.

ROBERT N. PURSEL, formerly with the Barco pipe line, where he did reconnaissance and location work, has been transferred to Texas Co. operations in Venezuela, on the engineering staff.

FRED W. BATES, consulting geologist of Lafayette, La., delivered a paper on "The Eola Field of Avoyelles Parish, Louisiana" at the meeting of the Houston Geological Society last week.

W. L. STEWART, vice president of Union Oil Co., chalked up another win for his yawl Chubasco and won the Shaw trophy for the annual 70-mile race around Catalina Island in the time of 20:48:32.

ALBERT W. GENTRY, junior engineer of Shell Oil Co., Inc., in the exploitation department with offices in Los Angeles, has been promoted to engineer, exploitation department, San Joaquin division, and will move his offices to Bakersfield.

THOMAS P. THOMPSON, of Bradford, Pa., a leading producer in the Bradford field, suffered a leg fracture while yachting off the coast of Florida last week. Mr. and Mrs. Thompson have been spending the winter at Hollywood Beach, Fla.

They're Easy for Him

Thomas Verner Moore, new chairman of the Petroleum Division of the A.I.M.E., handles complicated engineering formulas with the cheerful ease that the ordinary mortal displays in disposing of a club steak after 18 holes of golf. His most conspicuous work in this field has been in the development of mathematical formulas to determine the relationship between the rate of production of oil and gas from a reservoir and the rate of decline of the average reservoir pressure. It is recalled that the formula he devised for forecasting reservoir pressures in East Texas for any given rate of production conflicted with the opinion held by many engineers during the early life of that field, but later developments confirmed the correctness of his calculations.

Gittings

THOMAS V. MOORE

Mr. Moore was born in Omaha, Neb., in 1907. After graduating from Virginia Military Institute with a B.S. he decided upon an engineering career and he entered Rice Institute, in Houston, Tex., where he got a degree in chemical engineering. After that he was awarded a master's degree in engineering at the Massachusetts Institute of Technology. Taking a position in the production research laboratories of Humble Oil & Refining Co. in Houston in 1929, he soon was doing work that attracted attention, and in 1933 he was made head of the department, a post he still holds. Mr. Moore has produced many important technical papers on petroleum. He is active in the affairs of the A.I.M.E. and was a leader in organization of the Gulf Coast section.

DALE NIX has been appointed petroleum engineer in the foreign division of the Standard Oil Co. of California, with offices in San Francisco, Calif.

CHARLES A. MOON, formerly with Deutsche Vacuum Oel A. G., in Hamburg, Germany, has been transferred to New York, in the producing department of Socony-Vacuum Oil Co., Inc.

T. E. SWIGART, vice president of Shell Oil Co., Inc., Houston, Tex., was elected general chairman of the Houston Symphony Society's maintenance fund campaign for the orchestra's 1940-41 season.

HENRY N. TOLER, geologist with Southern Natural Gas Co., Jackson, Miss., and president of the Mississippi Geological Society, recently headed the second of the society's three state geological field trips, studying the Claiborne and Wilcox groups in Mississippi.

L. L. AUBERT, Bankline Oil Co., president of Oil Producers Agency of California for the past year, will possibly be succeeded as president of the agency by C. P. WATSON, of Seaboard Oil Corp., or CHARLES A. JOHNSON if Mr. Aubert can not be persuaded to accept another term of office.

FRED V. GORDON and E. J. PRESTON, of Los Angeles, and E. H. SCHARAGA, THAD STEVENS and MAURICE ANDERSON, of Salt Lake City, have organized the Dome Oil Co. and will drill a wildcat in the Spring Valley area of Uinta County, Wyoming. Mr. Gordon has been elected president; Mr. Preston has been elected vice president and general manager, and C. B. CRAPO is doing the geological work.

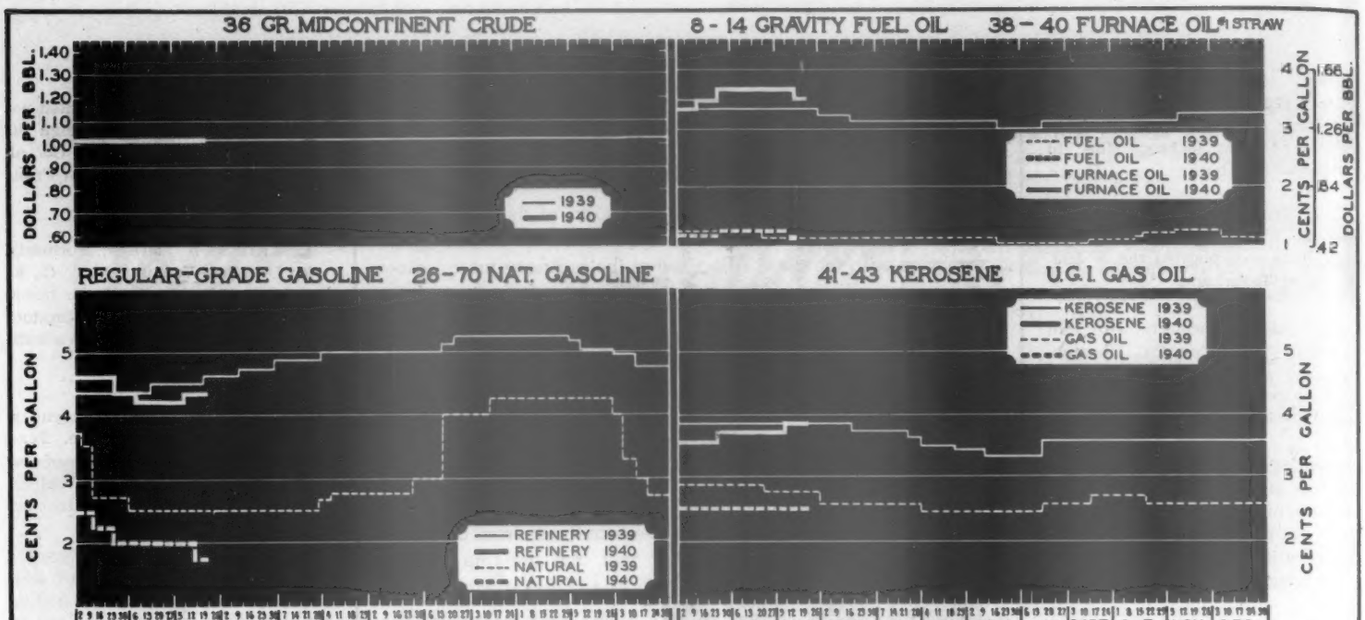
The "Big Game Hunter Fifth Annual Roundup," held in Houston, Tex., last Friday at the Braeburn Country Club was attended by more than 1,000 oil and business men from all parts of the state. The menu consisted of barbecued bear, deer, elk, mountain goat, moose, and antelope meat, obtained last fall and winter on hunting expeditions into Mexico and Wyoming. The "meat getters," who were hosts included A. T. (CAPT.) McDANNALD, ELLIOTT S. BARKER, GEORGE BAYS, RUSSEL BECHTEL, CARL BEILHARZ, HAROLD C. BISHOP, V. H. BRADY, AL BUCHANAN, WILLIAM CASON, DON COLLINS, DON DAVIS, GENE FARREN, COL. FOWLER, FORD FULLINGIM, PAUL GOODRICH, MARCUS GREER, FARRIS HALL, R. C. HOCHMUTH, JIMMY LAWRY, DAL LEGAN, TOMMY THOMPSON, C. B. WRIGHTSMAN, C. E. McDANNALD, CLEAVES McDANNALD, R. M. McDANNALD, W. A. McDOWELL, GUS MEYER, GEORGE E. B. PEDDY, LUCIEN POWELL, GORDON RICHMOND, C. A. RUSSE, ED SALRIN, FLOYD SENTER, HAROLD SHORE, A. D. SIMPSON, RAY W. SMITH, R. H. STARK, JR., JOHN SUMAN, CHASE SUTTON, and T. E. SWIGART.

LAWRENCE VANDER LECK, chairman of the Central Committee of California Oil Producers, is expected to be reelected chairman at the annual meeting of the Central Committee to be held within the next few weeks. Ballots for election of field representatives will go forward within a week.

H. S. JONES, Fort Worth, Tex., independent operator, left by plane last week for Miami, Fla., where he will be joined by FLOYD EARLE, also independent operator of Fort Worth, who is flying a new plane down to Miami from Pennsylvania. The two will hop off together for a trip to Santo Domingo and the Virgin Islands.

Shifts: R. W. BEATY, superintendent, Humble Oil & Refining Co., from Dickinson, Tex., to Tomball, Tex.; HERMAN A. JANZEN, engineer, Phillips Petroleum Co., from Borger, Tex., to Phillips, Tex.; W. B. HOGG, engineer, National Geophysical Co., from Magnolia, Ark., to Greenwood, Miss.; L. M. AYERS, manager, Hope Natural Gas Co., from Charleston, W. Va., to Pittsburgh, Pa.; R. W. MILLER, Hope Natural Gas Co., from Charleston, W. Va., to Pittsburgh, Pa.

DR. MERLE R. MEACHAM, general superintendent of Standard Oil Co. of New Jersey's Bayway, N. J., refinery, will become manager of refining operations in the southern division April 1, succeeding EDWARD A. RUDIGIER, who will retire on that date. Dr. Meacham started his technical and refinery work at Bayway in 1918 after obtaining his master's degree in chemical engineering from Purdue University and Ph.D. from Syracuse. He was made assistant general superintendent in 1921 and became Bayway's general superintendent in 1926. D. L. FERGUSON, who has been assisting Dr. Meacham at Bayway, will succeed him as general superintendent there. Mr. Ferguson has been with the company since 1920. He is a graduate of Purdue University's chemical engineering school and started his career in the development division of the Bayway plant. He was transferred to Colonial Beacon's refinery at Everett, Mass., as assistant manager. He became a director of Colonial Beacon in 1931 and was promoted to general manager of the refinery. In 1934 he went to France to manage the Port Jerome refinery of Standard Franco-Americaine de Raffinage, returning in 1938 as assistant general superintendent at Bayway.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

Natural Gasoline Breaks in Group 3 Market; Motor Fuel Demand Up

By T. F. SMILEY

THE predicted break in the Group 3 price of natural gasoline came in the past week. Motor fuels exhibited an improved tone. Heating oils were drifting to lower levels. Tractor fuels were strong. Lubricating oils and wax were holding.

Demand for petrolatum has been one of the surprises in recent oil-marketing history. Refiners regarded 1939 as an exceptionally good year in petrolatum sales, but the opening months of 1940 have witnessed phenomenal increases. One Mid-Continent company reports that its shipments of petrolatum in January were 50 per cent greater than its total shipments in 1939.

Dammed-Up Naturals Seek Outlets

Dammed-up naturals in Texas dropped a quarter cent in the effort to find outlets. The Oklahoma quotations on a Group 3 basis underwent a corresponding decline, though intrastate business was active and no distress stocks were reported. The larger manufacturers in both Oklahoma and Texas, with equipment necessary for stabilization, were continuing to convert large volumes of their 26-70 grade to lower vapor pressures, for which a readier market was available.

Demand for motor fuel was rising and quotations were firmer. Although substantial quantities of the regular grade were reported to be moving at 4⅜ cents, an increasing number of buyers were willing to pay 4½ cents for material meeting exacting specifications. Some gasoline was still being picked up at 4¼ cents, but it was understood to be of doubtful quality as to gum and sulfur content and distillation point.

The spring upturn so far has been very well restrained, and prices for gasoline are still so low that many refiners say they are unable to make a profit. Some are threatened with the necessity of shutting down. The difficulties of the small refiner are heightened by the growing demand for gasoline of higher octane ratings. It seems evident that in the near future all motor fuel used in modern passenger cars will require a cracked-gasoline base to provide the desired antiknock quality. This means that refiners who do not have cracking facilities will either have to buy cracked gasoline from other refiners or else depend largely on tractor-fuel demand to absorb their output.

Refined Oil Market Barometer

Gasoline continued its mild improvement in the Mid-Continent territory, but was weak on the Gulf and Pacific coasts, and reduced consumer tank-car prices throughout New England and most of New York testified to lack of strength there. Failure of natural gasoline in Texas to find outlets resulted in collapse of prices. Fuel oils losing ground. Kerosene and tractor fuel active.

MID-CONTINENT. Gasoline steadier. Naturals drop sharply. Heating oils off.

EAST COAST. Gasoline lacks firmness. Cold weather enabling heating oils to hold.

GULF COAST. Kerosene, light fuels and burning oils strong. Gasoline weakening.

PENNSYLVANIA. Gasoline shows little change. Fuel oil off. Lubricating oils lower.

CALIFORNIA. Gasoline weak. Fuel oil and diesel off. Kerosene softening materially.

CHICAGO. Gasoline slightly better. Light fuels easy. Heavy industrials giving ground.

The unprecedented accumulation of gasoline, estimated to be 10 to 12 million barrels greater than economic requirements, is causing earnest discussion of measures by which this evil may be mitigated, if not wholly eliminated. It is declared by some students of the problem that since the current burdensome stocks have resulted largely from accelerated refinery operations designed to meet the demand for fuel oils, the remedy lies in adoption of uniform operations throughout the year, geared to the demand for gasoline, but allotting to each month roughly one-twelfth of the total volume required. This program would call for storage of fuel oils in the summer and of gasoline in the winter. Its advocates say it would smooth out the present inequalities of supply and demand and would go far toward stabilizing both the gasoline and the fuel-oil markets.

Heating Oils Weaken

Demand for heating oils continued to slacken. All those grades not readily convertible into tractor fuel were weaker, with concessions easier to get. The No. 1 straw, which forms a borderline between the heating oils and the tractor fuels, since it has the same specifications as prime white with the exception of color, was hard to find; but in spite of that fact quotations softened.

Lubricating oils, notwithstanding further weakness in the East, remained steady in the Mid-Continent. Bookings for the second quarter will not be so heavy as those for the first, but promise to be satisfactory. Domestic consumption in this division will experience its seasonal rise, and it is expected to absorb any overheavy stocks even if export business slackens. Wax was fairly active at unchanged prices.

Consumer Tank-Car Prices Cut Half Cent Per Gallon in East

By H. STANLEY NORMAN

NEW YORK, Mar. 19.—Another thread snapped last week in the fabric of the northeastern motor-fuel market. Consumer tank-car prices on all grades of automotive fuel were reduced a half cent per gallon on March 14 throughout New England and New York, excepting western part of the state, which was left unaltered.

A week earlier the tank-wagon motor-fuel price was lowered a half cent per gallon in the five boroughs of New York City. Spot tank-car gasoline prices are fairly stable, but have dropped from a quarter to a half cent per gallon since March 1 at most important water terminals along the northeastern coast.

Reports persist that 68-70 and even 72-74 - octane motor fuel can be purchased in tank cars in the New York Harbor market for 6¼ cents per gallon. Actual sales at this new low figure are difficult to confirm. Issued quotations on regular gasoline, including 72-74 octane (leaded), range from 6½ to 7 cents at New York and as high as 7.7 cents for some of the more recently introduced branded products.

Despite continued existence of unfavorable motoring weather, most motor-fuel distributors report their volume from 5 to 8 per cent higher than for the corresponding period in 1939. The Bureau of Mines report for January shows domestic demand for motor fuel 6.9 per cent over the same month last year, but it was more than 8 per cent under the indicated requirements for December 1939.

Many market observers feel that gasoline prices can withstand further pressure between now and April 30, the period at which substantial drafts on storage normally start. Some of the refining companies use April 1 as their control point for motor-fuel stocks and are currently processing less crude oil to arrive at that date with inventory correlated to anticipated summer consumption.

During the first week in March, tank-wagon prices on regular gasoline at Philadelphia and Wilmington, Del., were lowered a half cent per gallon, but the tank-car price there seems slightly stronger than in the New York territory. Baltimore and Philadelphia suppliers are quoting from 6½ to 7 cents per gallon for 72-74 - octane gasoline and the same price range applied to 68-70 motor fuel at Savannah, Jacksonville, and Charleston. The low side of the Philadelphia market is off a quarter of a cent compared to the first week in April, probably in sympathy with the weakness in New York.

Subfreezing temperatures returned to a substantial portion of the northeastern marketing territory last week and sustained the heavy demand for all grades of burning oils. The position of stocks, particularly in the case of residual fuels, indicates that refiners are now in a better position to meet demand than during the middle of February. Drafts continue on gas-oil and distillate stocks, but this condition will cease within a few weeks. Two of the several suppliers who withdrew completely from the spot fuel-oil market during the peak-demand period are again quoting and accepting a limited volume of such business, although they are still withholding active solicitation.

Fuel-Oil Prices Firm

Fuel-oil prices remain firm in this section of the country, although the softening of quotations for Bunker C grade on the Gulf Coast has been reflected at Philadelphia, New York, and Boston in contracts covering requirements for the next 3 months. Bunker C fuel was available at a price range of 90 cents to $1.05 per bbl. on the Gulf last week, making the low side 10 cents below quotations existing through January and February.

Kerosene was still difficult to locate for spot-market trading in the New York district. Quotations range from 5.6 to 6.5 cents per gallon, with most of the spot business currently transacted at the high of the range. Contract limitations, however, force suppliers to deliver a bulk of present consumption at 5.6 cents per gallon in tank cars. Domestic burning oils are held at 5.1 to 5.6 cents per gallon, with the high of the quotation applying to spot sales in tank-car quantities. Consumption of furnace oil picked up again last week after a temporary lull while power lines were being repaired all along the eastern coast of New England. Scores of burners in Connecticut, Massachusetts, and other New England states were idle for nearly a week as a result of power-line failures caused by the wet snow and sleet which blanketed the Northeast 2 weeks ago.

Kerosene is quoted on the Gulf Coast at 4½ to 4¾ cents per gallon. A mixed cargo of kerosene and gas oil was reported sold on the Gulf Coast last week at prices of 4⅝ and 4 cents, respectively, for the two fuels. Most of the coastal refiners continue to ask from 4½ to 4¼ cents per gallon for No. 2 fuel oil in cargo quantities, although a few scattered suppliers are willing to shade the figures as indicated by the sale reported last week. Quantities of both No. 2 fuel oil and kerosene available at fractions under the quoted prices are extremely limited and several distributors report they have been unsuccessful in efforts to duplicate the figures reported for the sale made on the mixed cargo last week.

The extent to which reduced export business so far this year has influenced the position of United States refiners, particularly those on the Gulf Coast, became more tangible last week when the Bureau of Mines report on January became available.

January exports of motor fuel totaled 2,274,000 bbl., the lowest monthly figure that has been registered since 1936. Shipments for the month were 862,000 bbl. lower than for December 1939 and 1,364,000 bbl. behind motor-fuel exports for January 1939. Less export business in January than in December was also reported for light and heavy fuel oils. There has been no material change in the export picture so far this month, although rumors were current that the Allied buying commission was in the market for a small amount of lubricating oil.

No inquiries are currently reported in the market for export gasoline, confirming the views of many observers that curtailment of civil consumption abroad because of war regulations will make at least the first quarter and probably the first half year a disappointment for United States petroleum refiners in that direction.

Practically all grades of gasoline in the Gulf Coast district are down a quarter of a cent per gallon and some are off a half cent. Regular 72-74 - octane leaded motor fuel is available on the Gulf at 5¼ to 6¼ cents per gallon. Some New York distributors declare the low of the regular gasoline market on the Gulf can be shaded in several directions by an eighth of a cent. Limited supplies are available, according to information here, as low as 5 cents.

Western Pennsylvania product prices are approximately unchanged from the preceding week. Lubricating oils have apparently leveled off after a series of reductions over the past 3 or 4 weeks. Demand for neu-

(Continued on Page 127)

A. P. I. Weekly Refinery Statistics

Week Ended March 16, 1940

	Capacity reporting (per cent)	Daily crude runs (bbl.)	Total gasoline stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Residual fuel-oil stocks (bbl.)
East Coast	100.0	576,000	20,977,000	6,025,000	7,964,000
Appalachian	87.3	125,000	3,959,000	421,000	639,000
Ind., Ill., and Ky.	90.7	552,000	17,659,000	2,530,000	2,891,000
Okla., Kans., and Mo.	81.6	251,000	8,812,000	1,091,000	1,920,000
Inland Texas	50.3	115,000	2,056,000	266,000	1,356,000
Texas Gulf	90.0	839,000	16,424,000	2,981,000	5,762,000
Louisiana Gulf	97.8	135,000	2,943,000	623,000	966,000
N. Louisiana and Ark.	55.0	42,000	681,000	190,000	451,000
Rocky Mountains	54.2	42,000	1,766,000	142,000	534,000
California	90.0	473,000	18,344,000	9,166,000	79,075,000
Total reported	86.4	3,150,000	93,621,000	23,435,000	101,558,000
Est. unreported	.....	350,000	6,995,000	640,000	2,000,000
*Est. total	.....	3,500,000	100,616,000	24,075,000	103,558,000
*Est. total previous wk.	.....	3,450,000	99,397,000	24,560,000	103,825,000
*March 17, 1939	.....	3,250,000	86,280,000	27,358,000	110,837,000

*Bureau of Mines.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended March 9, 1940	245,762,000 barrels
Week ended March 2, 1940	244,126,000 barrels
Week ended March 11, 1939	272,852,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

Retail Oil Markets

Tank-wagon and filling station prices on gasoline and kerosene furnished by the larger marketing firms

Prices as of March 19, 1940

Taxes

The gasoline quotations given in the following tables include the 1-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Chicago, Ill.	15.1	13.1	4.0	10.0
Decatur	15.1	12.1	4.0	9.5
Joliet	15.1	13.6	4.0	10.0
Peoria	15.1	12.7	4.0	10.0
Quincy	14.9	13.4	4.0	9.8
Davenport, Ia.	15.1	13.6	4.0	‡10.0
Des Moines	14.9	12.4	4.0	‡9.8
Mason City	15.3	13.8	4.0	‡10.2
Duluth, Minn.	16.9	15.4	5.0	10.8
Mankato	16.5	15.0	5.0	10.4
Minneapolis	16.5	14.5	5.0	10.4
LaCrosse, Wis.	16.5	15.0	5.0	10.4
Green Bay	16.9	15.4	5.0	10.3
Milwaukee	16.3	14.8	5.0	10.2
Detroit, Mich.	13.6	12.1	4.0	7.6
Grand Rapids	13.2	11.7	4.0	9.0
Saginaw	14.8	13.3	4.0	9.3
Evansville, Ind.	16.6	15.1	5.0	†10.5
Indianapolis	16.8	14.3	5.0	†10.2
South Bend	16.8	15.3	5.0	†10.2
Fargo, N. D.	17.7	16.2	5.0	11.6
Huron, S. D.	17.0	15.5	5.0	10.9
Kans. City, Mo.*	14.4	12.9	4.0	8.0
St. Louis*	14.7	13.2	4.0	8.0
St. Joseph	14.4	12.0	4.0	7.9
Wichita, Kans.	13.3	11.1	4.0	7.0

*State tax 2 cents, 1-cent city tax, and 1-cent federal tax. †Does not include 4-cent state tax. ‡Does not include 3-cent state tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers: On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off; minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective February 15, 1940, f.o.b. Chicago tank-wagon prices: Standard heater oil, 1-99 gal., 9 cents; 100-149 gal., 8 cents; 150 gal. and over, 7.5 cents. Stanolex fuel oil No. 1, 1-149 gal., 9.5 cents; 150-399 gal., 7.5 cents; 400 gal. and over, 7 cents. Stanolex furnace oil, 1-149 gal., 8.5 cents; 150-399 gal., 7.5 cents; 400 gal. and over, 7.5 cents. Stanolex Grade A, 1-399 gal., 5.5 cents; 400 gal. and over, 4.5 cents. Stanolex Grade B, 1-799 gal., 5.25 cents; 800 gal. and over, 4.25 cents. Stanolex Grade C, 1-999 gal., 4.5 cents; 1,000 gal. and over, 3.5 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline			Kero.
	Cons'r tank wag.	Di- vided dir.	Incl. tax	tank wag.
Ohio points	15.5	14.5	5.0	*13.0

*Includes state tax of 1 cent.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
Atl'tic City, N. J.	11.6	12.7	4.0	8.1
Newark	11.6	12.7	4.0	8.1
Annapolis, Md.	13.35	14.35	5.0	9.5
Baltimore	12.75	13.75	5.0	7.5
Cumberland	14.15	16.15	5.0	10.0
Wash'gton, D. C.	11.00	12.0	3.0	9.5
Danville, Va.	14.95	17.45	6.0	11.5
Norfolk	13.75	16.25	6.0	11.0
Petersburg	14.05	16.55	6.0	11.7
Richmond	14.05	16.55	6.0	11.0
Roanoke	15.25	17.75	6.0	11.5
Charles'n, W. Va.	14.55	17.05	6.0	12.6
Parkersburg	13.85	15.35	6.0	11.2
Wheeling	14.85	16.75	6.0	11.8
Charlotte, N. C.	16.90	18.40	7.0	11.8
Hickory	17.45	18.95	7.0	12.3
Mt. Airy	17.30	18.80	7.0	12.2
Raleigh	16.65	18.15	7.0	11.5
Salisbury	16.95	18.45	7.0	11.9
Charleston, S. C.	14.75	17.25	7.0	9.25
Columbia	15.60	18.10	7.0	11.5
Spartanburg	16.30	18.80	7.0	12.2

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryand, District of Columbia, and in Arlington and Fairfax counties in Virginia; and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery; 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

Discounts for kerosene, 1 cent off tank-wagon price for 25 gal. or more under contract (contract not necessary in Baltimore), except no discount in New Jersey.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline			Kero.
	Cons'r tank wag.	Net dir.	Incl. tax	tank wag.
Atlanta, Ga.	18.0	18.0	7.0	10.0
Augusta	17.5	17.5	7.0	10.0
Macon	18.0	18.0	7.0	10.0
Savannah	16.5	16.5	7.0	9.0
Birmingham, Ala.	18.5	18.5	8.0	9.0
Mobile	18.5	18.5	9.0	8.0
Montgomery	19.5	19.5	9.0	11.0
Jackson, Miss.	16.0	16.0	7.0	10.0
Vicksburg	16.5	16.5	7.0	9.5
Jacksonville, Fla.	17.0	17.0	8.0	8.0
Miami	17.0	17.0	8.0	8.0
Pensacola	18.5	18.5	9.0	8.5
*Tampa	21.0	18.0	8.0	8.0
Lexington, Ky.	16.5	16.5	6.0	10.0
Covington	14.5	14.5	6.0	9.5
Louisville	15.5	15.5	6.0	9.0
Paducah	15.5	15.5	6.0	9.0

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

*Temporary discounts to tank-wagon consumers in Tampa 3 cents per gallon below consumer tank-wagon price on Crown gasoline.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
Albany	12.1	14.1	5.0	8.3
*Met. N. Y.: Manhat., Bronx, Queens, Brklyn., Staten Island	12.2	13.3	5.0	8.5
Buffalo	13.1	14.5	5.0	7.9
Rochester	13.3	15.0	5.0	8.5
Syracuse	12.7	14.5	5.0	8.8
Portland, Me.	12.1	14.1	5.0	8.5
Manchester, N.H.	12.7	14.5	5.0	8.9
Burlington, Vt.	12.6	15.1	5.0	8.7
Boston, Mass.	11.0	13.0	4.0	8.5
Worcester	11.6	13.3	4.0	8.0
Hartford, Conn.	11.4	13.3	4.0	8.4
New Haven	11.3	12.3	4.0	7.5
Providence, R. I.	11.0	13.0	4.0	8.5

*Does not include 2 per cent city sales tax, which is calculated on basis of net retail price exclusive of state and federal taxes. Metropolitan New York prices are undivided dealer prices; others are split dealer.

Effective February 15, 1939, the company changed its commercial consumer policy in New York and in New England points for tank-wagon delivery to the following: Annual purchases 10,000 gal. and under, tank-car price plus 2 cents per gallon; annual purchases 10,000 gal. up to 50,000 gal., tank-car price plus 1.5 cents per gallon; annual purchases 50,000 to 200,000 gal., tank-car price plus 1 cent per gallon; annual purchases 200,000 gal. and over, tank-car price plus ½ cent per gallon. Private consumers pay undivided dealer price, plus 2 cents per gallon. Private consumers receiving full compartment deliveries of at least 200 gal. receive a discount of ½ cent per gallon.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
Philadelphia, Pa.	12.0	12.8	5.0	10.5
Pittsburgh	13.0	14.5	5.0	10.5
Allentown	13.0	14.5	5.0	10.5
Erie	13.0	14.5	5.0	10.0
Scranton*	12.5	15.0	5.0	10.5
Altoona	13.0	15.0	5.0	10.5
Dover, Del.		13.5	5.0	10.5
Wilmington		13.5	5.0	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

*Voluntary discount of 1 cent allowed to dealers only.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline			Kero.
	Tank truck	Serv. sta.	Incl. tax	tank wag.
San Francisco	17.5	18.5	4.0	11.5
Los Angeles	17.0	18.0	4.0	10.0
Fresno, Calif.	18.5	19.5	4.0	12.5
Phoenix, Ariz.	20.0	21.0	6.0	*17.5
Reno, Nev.	20.5	21.5	5.0	13.5
Portland, Ore.	20.0	21.0	6.0	13.5
Seattle, Wash.	20.0	21.0	6.0	†13.75
Spokane	21.5	22.5	6.0	†16.75
Tacoma	20.0	21.0	6.0	†13.75

*Includes 5-cent state tax. †Includes 0.25-cent state tax.

Discounts to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Denver, Colo.	13.0		5.0	10.5
Grand Junction	17.5		5.0	12.5
Pueblo	13.0		5.0	9.0
Casper, Wyo.	16.5		5.0	11.5
Cheyenne	15.5		5.0	11.0
Billings, Mont.	18.0		6.0	12.0
Butte	19.0		6.0	13.0
Great Falls	18.0		6.0	12.0
Helena	18.5		6.0	12.5
Salt Lake, Utah	15.5	15.5	5.0	14.0
Boise, Idaho	21.1	21.1	6.0	16.0
Twin Falls	21.1	21.1	6.0	16.5
Albu'que, N. M.	13.5		6.5	10.0
Roswell	16.0	16.0	6.5	8.0
Santa Fe	17.5	17.5	6.5	10.0

*Includes city tax of 0.5 cent. †Includes state tax of 1 mill.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline			Kero.
	Cons'r tank car	Dir. tank wag.	Incl. tax	tank wag.
New Orleans, La.	14.75	17.25	8.0	†11.0
Baton Rouge	14.75	17.25	8.0	‡10.5
Alexandria	14.75	17.25	8.0	‡10.5
Lafayette	15.00	17.50	8.0	‡10.0
Lake Charles	14.75	17.25	8.0	‡12.5
Shreveport	13.50	16.00	8.0	‡9.0
Knoxville, Tenn.	18.00	20.50	8.0	13.0
Memphis	16.00	18.50	8.0	11.0
Chattanooga	17.50	20.00	8.0	12.0
Nashville	17.00	17.50	8.0	11.0
Bristol	18.25	17.75	8.0	13.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

†Includes 1-cent parish tax and 1-cent state tax. ‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Texarkana, Ark.	13.0		5.0	7.0
Fort Smith	14.5		5.0	7.5
Little Rock	16.75		7.5	8.0
Muskogee, Okla.	13.0	12.0	5.0	7.0
Oklahoma City	11.0		5.0	6.5
Tulsa	11.0		5.0	6.0

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Omaha	16.5	13.5	6.0	9.8
McCook	16.5	13.9	6.0	9.0
Norfolk	16.5	14.4	6.0	9.8
North Platte	17.8	14.9	6.0	10.0
Scottsbluff	18.5	15.5	6.0	10.0

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline			Kero.
	Tank wag.	Dir.	Incl. tax	tank wag.
Dallas, Tex.	12.0	16.0	5.0	7.0
Fort Worth	12.0	16.0	5.0	8.0
Houston	13.5	17.5	5.0	7.0
San Antonio	13.0	17.5	5.0	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada*

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Tank wag.	Incl. tax	Kero. tank wag.
Halifax, N. S.	25.0	10.0	19.0
St. John, N. B.	25.0	10.0	19.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	23.5	8.0	16.0
Hamilton, Ont.	23.5	8.0	16.0
Winnipeg, Man.	26.5	7.0	20.5
Brandon, Man.	28.0	7.0	22.9
Regina, Sask.	25.5	7.0	20.5
Saskatoon, Sask.	28.0	7.0	23.0
Edmonton, Alta.	25.9	7.0	20.9
Calgary, Alta.	23.0	7.0	18.0
Vancouver, B. C.	23.0	7.0	23.0

*Imperial gallon used in Canada.

Divided dealers pay tank-wagon prices. Discount to undivided dealers, 1 cent below tank-wagon price. In maritime provinces both divided and undivided dealers pay tank-wagon price.

Tank-Wagon Changes

Standard Oil Co. (Kentucky) February 27 advanced consumer tank-wagon and net dealer gasoline 1 cent in Atlanta; March 4, advanced consumer tank-wagon and net dealer gasoline 1.5 cent in Macon.

Continental Oil Co. March 4 reduced tank-wagon and dealer gasoline 1 cent in Albuquerque; March 8, reduced tank-wagon and dealer gasoline 1 cent in Denver and 2 cents in Pueblo.

Socony-Vacuum March 14 reduced consumer tank-car gasoline 0.5 cent generally throughout New England and New York, with the exception of western

(Continued on Page 127)

Prices of Refined Products

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted.

Prices as of March 19, 1940

The following quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.03⅝	.03¾
67-69 octane	.04	.04½
70-72 octane (regular)	.04⅜	.04½
60-62 400 grades:		
62 octane and below	.03⅝	.03¾
63-66 octane	.03¾	.04
67-69 octane	.04¼	.04½
70-72 octane (regular)	.04⅜	.04½
68-70 360	.04½	.04¾

NORTH TEXAS—

U. S. Motor grades:		
62 octane and below	.03½	.03⅝
63-66 octane	.03⅝	.03¾
67-69 octane	.04	.04½
70-72 octane (regular)	.04⅜	.04½
60-62 400	.03⅜	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
62 octane and below	.04½	.04½
63-66 octane	.04⅝	.04½
70-72 octane (regular)	.04⅞	.05

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
62 octane and below		.04
70-72 octane (regular)		.05

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
62 octane and below	.03¾	.04
63-66 octane	.04	.04¼
67-69 octane	.04¼	.04½
70-72 octane (regular)	.04½	.04¾
60-62 400 grades:		
62 octane and below	.03¾	.04
63-66 octane	.04	.04¼
67-69 octane	.04¼	.04½
70-72 octane (regular)	.04½	.04¾
68-70 360	.04⅝	.04⅝

PENNSYLVANIA (inland refineries)—

58-62 U. S. Motor		.05
72-74 octane (regular)	.06	.06¼

CALIFORNIA (domestic movement)—

54-58 U. S. Motor	.05¾	.07
58-60 400, 65 oct. and higher	.07	.08

EAST COAST (domestic)—

U. S. Motor, 65 and above:		
*New York (Bayonne)	.06¼	.07½
Philadelphia	.06⅜	.07½
Boston	.06½	.07½
Baltimore	.06¼	.07½
Charleston, S. C.	.07	.07¾

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
65-67 octane	.04⅝	.04¾
68-70 octane	.04¾	.05
70-72 octane (leaded)	.05	.05¼

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70		.01¾
Grade 18-55	.02⅛	.02¼

NORTH TEXAS—

Grade 26-70		.01½
Grade 18-55	.01⅞	.02

CALIFORNIA—

75-85 375-390	.05¾	.06

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70		.01⅞

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110-flash, 540-550 e.p.	.03¾	.03⅞
41-43 gr., 300-320 l.b.p., 110-125 flash, 500-520 e.p.	.03¾	.03⅞
46-48 gr., 210-230 l.b.p., 480-max. e.p.	.04	.04⅛

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

41-43		.03⅞
42-44		.04

NORTH TEXAS—

41-43	.03¾	.03⅞

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43		.03⅞

ARKANSAS (Ark. and N. La. del.)—

41-43		.03⅞

PENNSYLVANIA (inland refineries)—

45	.05	.05¼
46		.05¼
47		.05¼

CHICAGO (Based on Group 3)—

41-43	.03⅞	.04
42-44	.04	.04⅛

CALIFORNIA (Pac. Coast market)—

38-43 high burning test	.04½	.05¾

NEW YORK (Bayonne, N. J.)—

41-43	.056	.065

***GULF COAST (domestic)—**

41-43	.04½	.04⅝

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-42	.03⅝	.03¾
No. 1 straw, 38-40	.03½	.03⅝
No. 2 straw, 32-36	.03⅝	.03½
No. 2 dark, 32-36	.03¼	.03⅜
No. 3 zero to 10, 28-32		.03¼
No. 3, 15 and above, 28-32	.02¾	.02⅞

NORTH TEXAS—

No. 1 prime white, 38-42	.03¾	.03⅞
No. 1 straw, 38-40	.03⅝	.03¾

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.03	.03¼

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36		.03¾

CHICAGO (Based on Group 3)—

Range oil	.03¾	.03⅞
No. 1 prime white, 38-40	.03⅝	.03¾
No. 1 straw, 38-40	.03½	.03⅝
No. 2 straw, 32-36	.03⅝	.03½
No. 2 dark, 32-36	.03¼	.03⅜
No. 3, zero to 15, 28-32	.03¼	.03⅜
No. 3, 15 and above, 28-32	.02¾	.02⅞

NEW YORK (Bayonne, N. J.)—

*No. 1	.056	.065
*No. 2	.051	.056
*No. 4	.051	.06

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

U.G.I. gas oil, under 35	.02⅝	.02¾
No. 5, low pour point, 18-22	.72½	.77½
No. 6, 15 and above, 8-14	.50	.55

NORTH TEXAS—

U.G.I. gas oil, under 35	.02⅝	.02¾
No. 5, low pour point, 18-22	.75	.80
No. 6, 15 and above, 8-14	.45	.50

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.70	.75

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.02⅝	.02⅞
No. 5, low pour point, 18-22	.75	.80
No. 5, 15 and above, 18-22	.60	.70
No. 6, low pour point, 10-16	.60	.70
No. 6, 15 and above, 10-16	.45	.55

PENNSYLVANIA (inland refineries)—

36-40	.03⅞	.04

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.15	1.25
24 plus diesel, per bbl.	1.15	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 (bunkers at tidewater)	.65	.75
10-16 (cargo lots)	.65	.75
12-17 (tank cars)	.60	.75
10-17 (high sulfur)	.50	.65
San Joaquin Valley:		
10-18 (tank cars)	.50	.70
24 plus diesel, per bbl.	1.15	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.80	.85

GULF COAST—

No. 2 fuel		.04¼
43-47 diesel		.04
48-52 diesel		.04¼
53-57 diesel		.04½
58-and-above diesel		.04¾
Bunker C (bulk cargoes)	.97	1.00
Bunker C (bunkers)	.90	.95

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil	.051	.052
28-30 diesel (lighterage 6¼c per bbl.)	2.10	2.20
28-30 diesel (tank cars)	.05	.053
Bunker C (to ocean-going ships in N. Y. Harbor)		1.50
Industrial fuel (tank cars)	.035	.04

Lighterage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25		.28
150-160 D, 0-10		.24
150-160 D, 10-25		.23
100-110 D, 0-10		.23
100-110 D, 10-25		.22
Steam refined:		
600 dark green (untreated)		.08

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		.26
15 pour point		.25
25 pour point	.23½	.24
Steam refined:		
600	.13	.14
650	.15	.16
600 flash	.17	.18
630 flash	.19	.20

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.12
180-3		.13
180-4		.12½
200-3		.13⅛
200-4		.13
250-3		.15
250-4		.14½
280-3		.16
280-4		.15½
300-3½		.16½
400-3½		.17½
100-2½ paraffin oil		.07
10-25 pour point:		
200-3		.13
200-4		.12½
250-3		.14½
250-4		.14
280-3		.15½
280-4		.15

GULF COAST—

Pale oils:		
200-3	.07¼	.07½
300-3	.07¾	.08
500-3½	.08½	.09
750-3½	.09	.09½
1,200-3½	.09¾	.10
2,000-4		.10¼
Red oils:		
200-5-6	.07	.07¼
300-5-6	.07½	.07¾
500-5-6	.08¼	.08⅝
750	.08⅝	.09¼
1,200-5-6	.09⅝	.09⅝

CALIFORNIA (moving to dom. market)—

Pale oils:		
100-2½-3	.07¼	.08
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		.27½
10 pour point		.26½
15 pour point		.25½
25 pour point		.24
200 vis. at 70° F., 3 color:		
Zero pour point		.29½
10 pour point		.28½
15 pour point		.27½
25 pour point		.26

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale		.05½

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.05½	.05¾
124-126 (A.m.p.) w.c. scale	.05¾	.05¼

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax	.060	.063
128-130 (A.m.p.) wax	.061	.064
130-132 (A.m.p.) wax	.065	.066
133-135 (A.m.p.) wax	.067	.0685
135-137 (A.m.p.) wax	.069	.072
Crude scale:		
124-126 (A.m.p.) w.s.	.0525	.0550
124-126 (A.m.p.) y.s.	.0525	.0550
Petrolatum in barrels, carload lots:		
Dark green	.03125	.03375
Amber	.03375	.03625
Extra amber	.03625	.03875
Lily white	.05875	.06000
Snow white	.06875	.07000
Cream	.04875	.05000

Export Prices

GASOLINE

GULF COAST—

U. S. Motor	.05	.05⅜
60-62 400	.05¼	.06¼
61-63 390	.05¼	.06¼
64-66 375	.05⅜	.06¼

LOS ANGELES—

U. S. Motor grades:		
60-65 octane	.05½	.05¾
65-69 octane	.05¾	.06¼
Above 69 octane	.06¼	.06¼

KEROSENE

GULF COAST—

41-43 water white	.04¾	.05

LOS ANGELES—

41-43 water white	.05	.05¼

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.o.s. in bbl.)—

Cylinder stocks:		
600 S.R. unfiltered	.22½	.23
630 S.R. unfiltered	.24	.26
600 flash, S.R.	.25½	.27
630 flash, S.R.	.31	.32
Bright stock:		
Light, 25 pour point	.34	.36

NEUTRAL OIL

200-3 color	.35½	.36
150-3 color	.34	.36

PARAFFIN WAX

NEW YORK (prices per pound)—

123-125 A.m.p.	.0700	.0725
125-127 A.m.p.	.0725	.0750
128-130 A.m.p.	.0750	.0775
133-135 A.m.p.	.0775	.0800
135-137 A.m.p.	.0825	.0850
Crude scale:		
124-126 w.s.	.0525	.0550
124-126 y.s.	.0525	.0550

EQUIPMENT PROGRESS...

Republic's Larger Stainless-Steel Facilities Put Into Operation

Republic Steel Corp. recently put into operation its improved and expanded stainless-steel facilities in Canton and Massillon, Ohio. To celebrate the event the

company threw open the doors of the cold-rolling and stainless-finishing plant in Massillon to families and friends of those employed in this department. The stainless department now occupies all wings of a 5-acre building.

A 25-ton electric furnace was tranferred from Buffalo, N. Y., and a new 50-ton unit was added to the company's battery of six electric furnaces in Canton, where the stainless steel is produced.

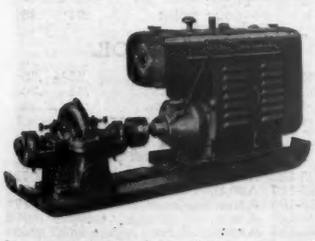
With the exception of the hot rolling of coils, which is done in nearby Warren, Ohio, Republic now has concentrated all its stainless-steel operations in the Canton and Massillon plants. The improved and expanded facilities give Republic a stainless capacity in the strip department alone of 1,200 tons per month.

With the new facilities, Republic will be able to produce coils of cold-rolled stainless strip as narrow as ¼ in. and as wide as 23⅛ in.

The largest single use for stainless steels is automobile trim. Probably one-third of all stainless produced today goes into the radiator grilles, hub caps, molding, etc. It has important uses in the petroleum industry.

Independently Powered Pumps Are Introduced by Allis-Chalmers

To provide independently powered pumps for drainage, construction jobs, and similar applications, Allis-Chalmers Manufacturing Co. has introduced a line of centrifugal pumps driven by gasoline-power units. Since these units are independent of any outside source of power, they may be used as standby units in emergencies when other sources of power fail.

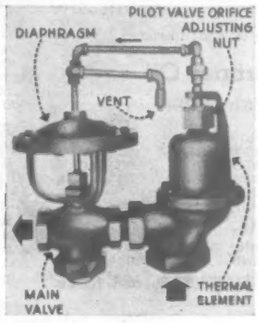


Power units in five sizes (18 to 110 hp.) afford economy in operation, with a choice of gasoline, kerosene, distillate, natural gas, or butane as fuel. All power units have valve-in-head medium-speed engines, with removable cylinder liners, efficient cooling systems, force-feed lubrication, and a variable-speed governor.

The centrifugal pumps are horizontal-shaft, single-stage, single or double-suction pumps designed for handling liquids at normal temperatures with maximum efficiency. To facilitate handling, the engines and pumps are mounted on a base and are available in many combinations to meet various requirements in quantity and pressure up to 5,000 g.p.m. and 100-ft. head. A folder (Form MS 253) describing these engine and pump units may be obtained from the Tractor Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Armstrong Eliminator Removes Air From Heated Retorts

Typical industrial uses of the Air Eliminator, announced by Armstrong Machine Works, 868 Maple Street, Three Rivers, Mich., include removal of air from steam-heated retorts, creosoting cylinders, and on-and-off steam mains. The unit consists of a conventional type of diaphragm valve to which has been added a special dome-shaped inlet chamber. Housed in the dome of the inlet chamber is a bellows-type thermal-expansion unit which raises and lowers a needle valve that seats against an orifice mounted in the top of the dome. This valve acts as a pilot valve to admit pressure to the top of the diaphragm. The pipe above the diaphragm is fitted with a small relief vent which dissipates the pressure above the diaphragm when the pilot valve is closed.



Operation, which is automatic, is based on the fact that air in a steam system has the effect of lowering the steam pressure and hence its temperature. A mixture of air and steam entering the 2-in. inlet cools the thermal unit, which contracts and opens the needle valve. This, in turn, applies pressure to the diaphragm, which is depressed, thus opening the main valve and permitting the steam-air mixture to escape through a 1¼-in. outlet. When the air has been exhausted, pure steam envelopes the thermal elements, causing it to expand and close the needle valve. With pressure relieved above the diaphragm, internal pressure forces the main valve to close.

The sensitivity of the air eliminator can be adjusted by means of a needle-valve regulating nut. The unit is self-compensating for changes in steam pressure. It is 12½ in. in height, weighs 30 lb., and has valve bodies made from bronze.

Whitlock Changes Name

By vote of the stockholders on February 13, 1940, the corporate name of "The Whitlock Coil Pipe Co." was changed to "The Whitlock Manufacturing Co." The management, the character of its organization, and its products remain unchanged. The company will continue to manufacture its present lines of heat exchangers, storage water heaters, and miscellaneous heaters for widely varying purposes and will continue its department for the coiling and bending of pipe as heretofore.

Regan's Newest Traveling Block Offers Safety to Derrick Man

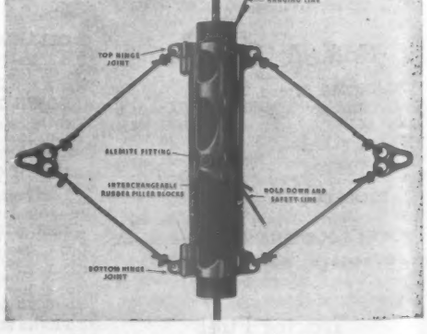
A new traveling block for 400 and 500-ton capacities has been developed by Regan Forge & Engineering Co., P. O. Box 150, San Pedro, Calif. It is a narrow block, with five or six sheaves, and is enclosed with streamlined safety guards. It offers a maximum of safety to the derrick man, who exerts less energy in swinging the block to bring the elevators into position for handling drill pipe. For five sheaves, the width is only 23 in., and for six sheaves 26½ in. Height of the block is 125 in.

The sheaves are of special-alloy cast steel, with grooves ground to A.P.I. specifications. Rims are machined parallel and the spokes and hubs of all sheaves are subjected to impact test to eliminate those having excessive shrink stresses. The sheaves are statically balanced. Massive anti-friction roller bearings handle the tonnage with a margin of safety of 3 to 1. Inner plates are of A.S.T.M. Class A 95-36 steel castings, with sufficient ribs disposed to relieve casting strains. Bearings are of S.A.E. 3135 forged steel, carburized and heat-treated.

Main connecting pins are of S.A.E. 1030 rolled steel, machined to maintain perfect alignment of bearings. Due to the narrowness of the block, it can be operated close to large stacks of drill pipe. It is known as the Type H 104-in. narrow traveling block, and is not to be confused with the Type G Regan 121-in. block.

New-Type Wire-Line Guide Is Aid in Sleeve Replacement

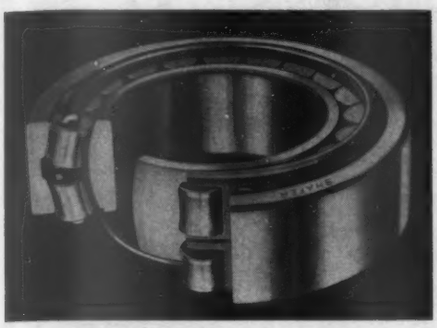
To expedite the replacement of rubber sleeves when they become too worn for efficient service, Patterson-Ballagh Corp., 1900 East Sixty-fifth Street, Los An-



geles, Calif., has developed a hinged-type, 4-section wire-line guide. The halves of the metal housing are held together by top and bottom hinge joints and clamped with lock nuts on the opposite side for quick removal of the rubber cylinder. A hanging line and a hold-down line are provided to stabilize the guide.

Shafer Announces Self-Contained Double-Row Roller Bearings

Shafer Bearing Corp., 35 East Wacker Drive, Chicago, announces a new type of double-row roller bearing available in DE 200 series, sizes from 3.1490 to



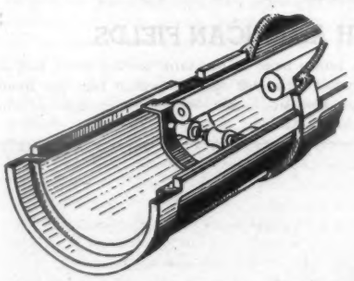
5.9045-in. bore; and DE 300 series, sizes from 1.9680 to 5.1171-in. bore.

The DE series is a self-contained double-row angular-contact type. Shafer concave rollers operate between convex races, the one-piece outer race having two ground raceways. The concave-roller design provides self-alignment within the bearing itself, and capacity for radial loads, thrust loads in either direction, or any combination of radial and thrust loads.

Rollers are of generous size, and the design permits use of a maximum number, providing generous double-row roller-bearing capacity in a compact bearing assembly. The exclusive Shafer concave-roller design provides inherent self-alignment, insuring free-rolling action under conditions of shaft deflection or misalignment. Thrust capacity is provided through the shape and position of rollers and races, without requiring auxiliary means of taking thrust. Complete information is given in Catalog 15.

Protection for Buried Lines Given By Dickey Split Conduit Pipe

W. S. Dickey Clay Manufacturing Co., Kansas City, Mo. (plants in Pittsburg, Kans.; Deepwater, Mo.; Texarkana, Ark.; San Antonio, Tex.; Birmingham, Ala.;



Chattanooga, Tenn.), announces a new product, the side-socket split conduit pipe for encasing underground steam lines or other types of underground lines that require protection from alkali chemicals, causing disintegration.

This product is vitrified and glazed, has increased strength, foundation burned in, side socket sealed with asphalt insures a tight joint, simple and economical installation. Made in 4-in., 6-in., 8-in., 10-in., 12-in., 15-in., 18-in., 21-in., and 24-in. diameters.

This company announces an improved 4-in. and 6-in. glazed clay acidproof pipe, for salt-water lines, with self-centering feature. Extra scorings provide additional strength and insure tight, leakproof joints.

Valv-Amp Offers Longer Motor Life With Lower Maintenance Cost

Offering the advantage of longer motor life, with less maintenance, a new-type rotor construction announced by General Electric makes possible the use of cast-aluminum rotors in the larger sizes of double-squirrel-cage motors for high-starting-torque, low-starting-current service. Called the "Valv-amp" rotor, it makes use of a unique shape of rotor slot and a special method of assembling rotor punchings to control the flow of starting current. As a result, without the use of a switch or other moving parts, current is permitted to flow in the outer squirrel-cage when the motor is started, thus producing low starting torque. Then, when the motor comes up to speed, current is allowed to flow through the entire rotor "winding," resulting in excellent running characteristics.

Of the two conventional methods of double-squirrel-cage-rotor construction, i.e., casting the conductor bars and short-circuiting rings integrally or joining them by brazing, the former method is by far the more satisfactory because it is a simpler operation, with smaller chance for human error, and results in a more compact, uniform product. However, until the Valv-amp development, it has not been practicable to cast double-squirrel-cage rotors in the larger sizes.

The Valv-amp development allows construction of larger cast-rotor motors which inherently combine the advantages of the double-squirrel-cage motor, such as high starting torque, low starting current, and excellent running characteristics, with advantages of the conventional cast-rotor motor—simplicity of construction, long motor life, little maintenance, and permanence of electrical characteristics.

TRADE LITERATURE

INTERNATIONAL HARVESTER ORGANIZATION, 180 North Michigan Avenue, Chicago.—Current number International Power.

AMERICAN CHAIN & CABLE CO., Bridgeport, Conn.—New edition of Catalog 365 of welded chains, including Endweldur chains, a new development.

WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.—Bulletin H-620-B22, Worthington balanced-angle two-cylinder air compressors.

McEVOY CO., 600 Milby Street, Houston, Tex.—Catalog 40WW, containing complete descriptions of all McEvoy water-well equipment.

JOHNS-MANVILLE, 22 East Fortieth Street, New York.—Current number the Power Specialist and 20-page illustrated brochure, "Transite Movable Asbestos Walls."

B. F. STURTEVANT CO., Hyde Park, Boston, Mass.—Bulletin 418-4, coolers for heavy-duty engines.

CATERPILLAR TRACTOR CO., Peoria, Ill.—32-page booklet showing mechanical features and capacities of Series 12 motor graders.

CHICAGO BRIDGE & IRON CO., Old Colony Building, Chicago.—Current issue the Water Tower, featuring "The Hortonspheroids of Aruba."

GENERAL ELECTRIC CO., Schenectady, N. Y.—Bulletin GEA-2915A, general-purpose capacitator motors.

MARMON-HERRINGTON CO., INC., Indianapolis, Ind.—Current number Marmon-Herrington All-Wheel-Drive Pictorial News, showing ability of company's vehicles to cope with desert sand, snow, slush, mud, hills, ditches, marshes, etc.

WESTINGHOUSE ELECTRIC & MANUFACTURING CO., East Pittsburgh, Pa.—Booklet, DD-36-116, on disconnecting switches; and folder, F-8524-A, air circuit-breaker switchgear.

Cathead Attachment Is Designed To Prevent Fouling of Catline

A cathead attachment designed to eliminate accidents due to the tangling or fouling of the catline is now available from Byron Jackson Co., P.O. Box 1307,

Arcade Station, Los Angeles, Calif. This device, designated the BJ Elliott rope guard, consists of a curved arm suspended from above the cathead, which separates the first and second wraps of the line. A latching device on the bottom and a hinge at the top permit the arm to swing outward for easy removal or placement of the rope.

A large percentage of cathead accidents are due to tangling or fouling of the catline between the first and second wraps of the rope, these accidents occurring whether the cathead and line are new or worn.

International Business Rises

P. V. Moulder, assistant domestic sales manager of International Harvester Co., directly in charge of truck sales, reports a decided improvement in general business conditions since the first of the year. He is expecting this improvement to be a factor in increasing International motor-truck sales. Figures should even be better than those of 1939, he said, when total International new-truck registrations were 66,048 as against 55,836 for 1938 or an increase of 18.29 per cent.

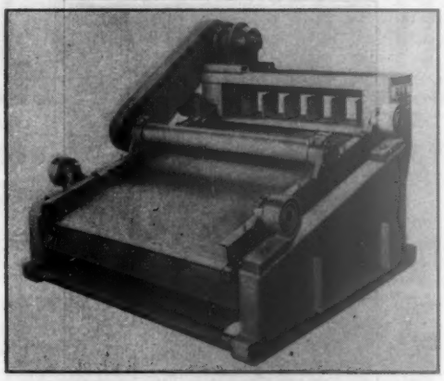
DOWELL PUTS NEW CHEMICAL PUMPING UNIT IN FIELD

Here is a side view of a new chemical pumping unit, showing special pumps, auxiliary motor, and other equipment mounted on a chassis designed for Dowell,

Inc., for use in inhibited acidizing of oil and gas wells. It is the latest addition to the large fleet of mobile units now in use by this company and is a direct result of a constant and far-reaching program of research carried on by the Dowell field staff and laboratories in cooperation with leading oil producers of the United States, Canada, and Mexico. This chemical pumping unit has already been assigned to field research work.

Rex Mud Screen Designed to Meet Present-Day Drilling Demands

Chain Belt Co., Milwaukee, Wis., announces a new unit for the oil fields, the Rex mud conditioner. It is designed to meet the requirements of present-day drilling practices and to insure high-capacity clean screening at low cost. It incorporates design features which are said to make it a specially valuable unit for the removal of shale, sand, and cuttings from rotary drilling mud, along with trouble-free operation.



Some of these features are a screen area of 20 sq. ft.; a screen which stretches crosswise and lengthwise, eliminating dead spots; cushion-rubber screen-cloth support; stainless-steel screen cloth; oil-lubricated vibrator and feed-control gates.

The new Rex mud screen is a low head-room, compact unit, ruggedly built, complete in itself, and easily moved from one location to another.

Cesco's Wide-Vision Goggle Offers Full 150-Degree Effective Range

A full 150° effective range of vision is offered in the improved No. 220 wide-vision goggle, one of the latest developments of Chicago Eye Shield Co., Department R, 2362 Warren Boulevard, Chicago. This is said by the manufacturer, to be tantamount to obtaining the widest practical degree of working vision through the medium of lens-embodying eye-protective devices. Hardened safety lenses provide maximum protection against severe impacts. Both lenses are easy to renew, by sliding them through the outer side of each eye-cup, and inserting the new replacement.

One of the important features found in the Cesco 220 wide-vision goggle consists of the new one-piece molded cushion pad, which is composed of a pliable material highly resistant to perspiration. These cushion pads are said to conform to varying contours of practically every wearer, seating each eye-cup comfortably and snugly. Additional ventilation holes in the rustproofed metal portion of the eye-cups increases cool air circulation. The nose bridge is adjustable to varying facial widths, which contributes to the general value of the unit.

Solution of Safe-Water Problems Is Offered by Pur-O-Pumper

Solution of the problem of a safe water supply for pipe-line construction jobs, wildcat operations, refineries, oil-field camps, and wherever men are on the move or are located temporarily only, is offered by the Pur-O-Pumper, manufactured by Proportioneers, Inc., 9 Codding Street, Providence, R. I. The Pur-O-Pumper serves also to augment established water systems. It may be used as a standby in emergencies. It fills the need of those who install a water system seasonally or who may move their water supply from year to year.

Purification problems in which the rate of flow is small can be handled with the company's standard packages. The package may include for complete purification: (1) Filtration; (2) chlorination; (3) coagulation; (4) pH control; (5) pumping; (6) gasoline-engine or other drive means; (7) portability due to light weight.

This standard package has been built and tested with pumping capacities and filtering rates of nearly 20 g.p.m., which through bypassing the filters may operate as a straight pumping and chlorination plant up to 40 g.p.m. Larger units can be furnished by sacrificing to some extent the portability feature. By reducing capacity requirements, still more portable Pur-O-Pumpers are available. On government test, Pur-O-Pumpers have reduced 100-turbidity waters down to 3 turbidity; and 3-residual, 200-turbidity water was reduced to 20. These results were attained at pumping rates of 12 to 15 g.p.m., without backwashing between runs of 2 hours' duration (2,000 gal. total).

Improved Line of Stabilflo Valves Designed for Accurate Work

An improved line of Stabilflo controlled valves designed for accurate response to the demands of a control instrument, without sacrifice of rugged construction, has been announced by the Foxboro Co., Foxboro, Mass.

As equipped with a wide range V-port plunger, the valve has a rangeability of 50 to 1. When this valve is lifted off the seats, the initial clearance flow is 2 per cent. From this 2 per cent flow to 100 per cent flow, the valve gives equal percentage increases in flow for equal amounts of valve lift. The V-port plunger is screwed and pinned to the valve stem and designed for easy field reversal. In addition to this V-port valve plunger, a parabolic plug type and a wide radio turned plug type are also available for exceptional control applications.

The body and plunger of the Stabilflo valve are designed for high lift. This is absolutely necessary in order to produce a valve with wide-range flow characteristics that modern automatic controllers require. High-lift construction also affords twice the movement for the same air pressure change as ordinary valves. The accuracy of positioning is twice as great—a vital matter in many processes.

Accurate and efficient operation of the complete line of valves is provided by the Stabilflo floating power motor. Suspended construction of this motor eliminates the need for guides and antifriction bearings.

Rock Bit Meets Demand for Faster Speeds in Deep-Hole Drilling

Globe Oil Tools Co., Los Nietos, Calif., has a new rock bit, the Series J, developed especially to meet the demand for fast straight-hole drilling speeds in all formations from surface hole to bottom, such as quartzite, sticky shales, hard limes, dolomite, medium sand rock, granite, chalk, hard formations.

Type JGD-1

The Series J is manufactured in six general types, each type having variations adapted to every possible sand, etc. The Type J-SD, for example, is for drilling in sticky shales as the widely spaced Hydrokleen teeth prevent balling up in such formations. The Type J-XXX is for fast hole in the hardest strata. Between these two extremes are other special types, adapted to various formations and conditions.

The two-way inner cutters, five-leg cutter supports, Hevi-Load bearings, and Hydrokleen teeth are exclusive features. The first mentioned gives a double-action cutting surface that cuts through the hardest formations with maximum straight-hole penetration, eliminates tracking, and keeps the cutters clean under all conditions of service. The patented fifth leg is an integral part of the bit body and provides strength in excess of actual requirements for the support of gage and inner cutters. Instead of the gage and inner cutters being supported from the outside legs only, each is anchored firmly on both sides by integral parts of the bit body. This added support also enables the cutters to maintain their proper alignment under the heaviest drilling loads and assures maximum full-gage hole on every run. Further information contained in Bulletin 21.

CEMENTING UNIT DESIGNED FOR SOUTH AMERICAN FIELDS

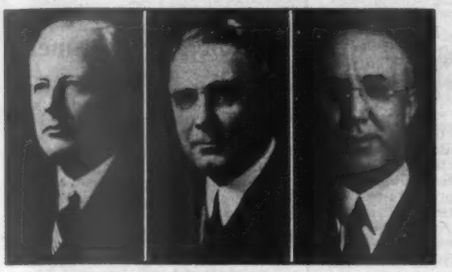
Especially designed and developed for use in four different oil fields in South America, the cementing unit shown here was furnished recently to the Argentine Government by Halliburton Oil Well Cementing Co., Duncan, Okla. The primary use of the equipment is to mix and deliver cement slurry to the oil-well casing head for cementing casing, plugging back the bottom of the hole, squeeze-cementing the formation, and similar uses. The units consist of two pumps of the high-pressure type, mounted side by side, each powered by individual Hercules engines Model RXC.

The pump next to the tank on the front end of the semitrailer provides mixing water for the hydraulic jet-type cement mixer, which is capable of mixing 1,000 sacks of cement into a suitable slurry per hour. The other pump is used for lifting the slurry from the cement-mixer vat and delivering it to the well head. The pumps are so manifolded that they can be operated in parallel or in series for high pressure or large volume. The two Hercules RXC engines, 4⅝ by 5¼, are provided with five-speed transmission and clutch for the flexible operation of the pumps.

AMONG EQUIPMENT MEN...

American Locomotive Advances Three of Its Top Executives

William Carter Dickerman, formerly president of American Locomotive Co., has been made chairman of the board. Duncan W. Fraser, formerly vice president.



DICKERMAN *FRASER* *McCOLL*

succeeds Mr. Dickerman. Robert B. McColl, who was vice president of American Locomotive Co., Alco Products Division, takes the place of Mr. Fraser.

Mr. Dickerman, born in Bethlehem, Pa., graduated from Lehigh University and in 1896 entered the employ of Milton Car Works, Milton, Pa. In 1899, on formation of American Car & Foundry Co., of which Milton Car Works became a part, he was appointed assistant manager of the Milton district. Transferred to New York in 1900, he became general sales agent, which position he held until 1905 when he was made vice president. In 1919 he became vice president in charge of all operations of the company. In 1929 he was elected president of American Locomotive Co.

Mr. Fraser, born in Nova Scotia, served an apprenticeship at the Rhode Island Locomotive Works. In 1904, when American Locomotive acquired the Montreal Locomotive Works, Ltd., Mr. Fraser was transferred to Montreal where he became managing director. In 1920 he was appointed vice president of American Locomotive, with headquarters in New York. In 1924 he became a director, and in 1939 a member of the executive committee.

Mr. McColl, born in Scotland, attended the Science and Art College. He was employed by Robert Stephenson & Sons, locomotive builders, Darlington, England, as draftsman. In 1905 he went to the Montreal Locomotive Works, Ltd., Montreal, and became works manager. In 1936 he was elected president of Alco Products, Inc., and when Alco Products was merged with the parent company Mr. McColl became vice president of American Locomotive Co., Alco Products Division.

Smith Chief Engineer for Buda

Harold G. Smith has been appointed chief engineer of the engine division of the Buda Co., Harvey, Ill. Mr. Smith for several years has been associated with the internal-combustion engine industry. Among other organizations he is a member of the American Society of Mechanical Engineers. He is also a member of the Engine Standards Committee of the Society of Automotive Engineers.

Larkin Packer Adds to Sales Staff

Additions to the sales force of Larkin Packer Co., St. Louis, Mo., include R. E. Smith, with headquarters in Mount Carmel, Ill.; Al Ferguson, assigned to Pampa, Tex.; H. F. Wright, in Hobbs, N. M., and A. H. Rucker, Fort Worth, Tex. M. L. Jackson has been assigned to new territory including East Texas, North Louisiana, Arkansas, and Mississippi, with headquarters in Shreveport, La. Burke Smith has been transferred from Evansville, Ind., to Salem, Ill. W. B. Porter is now district manager for a territory which includes Illinois, Indiana, Michigan, Kentucky, Kansas, Oklahoma, the Texas Panhandle, and part of North Texas. His headquarters are in Tulsa.

J. B. Templeton Made President

J. B. Templeton, formerly vice president of Templeton, Kenly & Co., Chicago, manufacturer of Simplex jacks and equipment, was elected president of the organization at the annual meeting to succeed W. B. Templeton, who is now chairman of the board of directors. J. B. Templeton in 1928 started in the company's shops to learn the business from the ground up. Eventually he entered the sales department, working in different parts of the country and becoming familiar with the problems of users of jacks in the oil fields, construction projects, utilities, etc. Next he was manager of the New York office where he was in intimate contact with export activities. In 1935 he assumed the duties of vice president and sales manager.

Ruf Made President of Rig & Reel

The board of directors of the Parkersburg Rig & Reel Co., last week elected Casper A. Ruf president and general manager to succeed David B. Crawford, who resigned. Mr. Ruf has served the company as vice president and general manager since February 13, 1934. He entered the service of Parkersburg Rig & Reel 20 years ago. Mr. Crawford will continue as a director of the company.

Other officers chosen are: John M. Crawford, chairman of the board; Harold D. Crawford, vice president; Bernard M. Farson, secretary and treasurer. Harold D. Crawford, the new vice president, was promoted from assistant sales manager.

James D. Hughes Joins Universal

In keeping with its program of expansion, Universal Exploration Co. has added James D. Hughes to its staff. Mr. Hughes resigned his position as Gulf Coast division sales manager for Lane-Wells Co. on March 1 to accept his new position as vice president of Universal Exploration Co. with offices in the Shell Building, Houston, Tex.

Salesmen End District Meetings

The final meeting in a series of district gatherings for salesmen of Pittsburgh Equitable Meter Co. and Merco Nordstrom Valve Co. was held this week at the factory in Pittsburgh, Pa., with representatives from the Pittsburgh and Buffalo sales offices attending. Starting early in January in Tulsa, the company has held sales meetings at weekly intervals in its district offices. Each meeting was conducted by Capt. A. E. Higgins, vice president and sales manager, who outlined plans for 1940. A. D. MacLean, chief engineer, presented the engineering aspects of recently introduced or improved products.

Sappington to Head Field Work

Chester Sappington, well known in oil circles, has joined the staff of General Geophysical Co. as vice president in charge of field work. Mr. Sappington, who has had wide experience in geological and geophysical work, graduated from Oklahoma University in 1928 with a B.S. degree in geological engineering. He became a scout for a large oil company, for which later he did geological work. He resigned in 1932 to become associated with a well-known Texas geophysical company and served in every capacity of field work in the Gulf Coast, Mississippi, Louisiana, and West Texas. At the time of his resignation to enter the service of General Geophysical he was field supervisor. Mr. Sappington's headquarters will be in the Houston, Tex., office, in the Gulf Building.

Richardson Fills New Post

The Timken Roller Bearing Co. has appointed William H. Richardson assistant general sales manager. This is a new position created because of the increase in the company's activities in bearings for general industrial use, in the automotive and aviation fields; in the broader field being covered by the company's steel division for alloy steel bars, carbon, and alloy seamless tubes, and in the construction and mining industries. Mr. Richardson has been with the company 23 years. E. H. Austin, who will succeed him as general manager of the service-sales division, has been with the company 21 years. R. P. Proffitt has been appointed Chicago division manager.

Joins Western Geophysical Co.

George Hill Stoddard, who has joined Western Geophysical Co., Los Angeles, Calif., as special representative in charge of customer relations, is a native Californian from Grass Valley and a graduate of the University of California. For many years he was manager of the Associated Supply Co., San Francisco, resigning to become affiliated with Lucey Manufacturing Corp., traveling throughout the United States and Mexico.

In 1918, with Leonard W. Buck (son of Frank H. Buck, one of the founders of Associated Oil Co.), Mr. Stoddard organized the firm of Buck & Stoddard, distributor of oil-country equipment and products. He will concentrate on sales promotion and developing work.

Dearborn Men Studying Product

Representatives of Dearborn Chemical Co. are attending a sales conference this week at the company headquarters in Chicago, where they are studying the manufacture and installation of Dearborn's new and improved line of pipe-line wrapping. Representatives in attendance include Ted Kittridge, Little Rock, Ark.; B. E. Connelley, Fort Worth, Tex.; J. M. Haltom, Oklahoma City, Okla.; I. L. Yetman and Jack Riley, Tulsa.

BUSINESS NOTES

Jay Irwin has been made Chicago district manager of the Steel and Tube Division of Timken Roller Bearing Co. Since October 1937 he had been a salesman in the Chicago office.

Joe S. Thompson has been appointed district sales manager of the Chicago office of the Babcock & Wilcox Tube Co., Beaver Falls, Pa. Mr. Thompson has been with the company since 1934, and was transferred to Chicago as a salesman in 1937.

Otis Pressure Control, Inc., has moved its general offices in Dallas, Tex., from the Tower Petroleum Building to 6612 Denton Drive.

CLASSIFIED ADVERTISING

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Patents obtained — infringement practice in all Courts—oil field experience, 1807-11 Tower Petroleum Bldg., Dallas; 2014 Second Nat'l. Bank Bldg., Houston. 506 Aztec Building, San Antonio, Tex., 457 Munsey Building, Washington, D. C. Address any of these offices.

Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

BROKERS and SALESMEN
only
A complete SERVICE EXPERTS in every department of the Oil Business at your SERVICE a REAL SET-UP. The best opportunity ever offered you. Leases in large or small lots at
WHOLESALE PRICES
Write today and get started right.
OIL BROKERS EXCHANGE
Santa Fe, New Mexico.

NEW MEXICO WEEKLY OIL REPORT. Send for sample copy.
BOX 968, HOBBS, N. M.

FOR complete and accurate coverage of the new Artesia Area, read The ARTESIA (New Mexico), ENTERPRISE. $2 a year.

COLORADO LEASE AND ROYALTY ACREAGE.
A great un-developed oil State, no proration; Rotary now drilling deep test. Royalty and Lease acreage near in Huerfano quadrangle.
JAMES E. TRESSLER
Walsenburg, Colo.

LOCALE with torsion balance, coredrill have positive proof, we contract T.B. Exploration core. Shotpoint. Shallow oil drilling. Take part oil. Core and T.B. Expl. Box 182, Odessa, Tex. Ph. 9572.

HAVE blocked 4,000 acres in 18-12, Barton County, Kansas. Hess Oil Co., Dwight Building, Kansas City, Missouri.

FOR SALE: Oil and Mineral Lease on TEN THOUSAND ACRES LAND, FIVE MILES WEST OF TEST OIL WELL "Gillican No. 1." Clinch County, Georgia. Chas. E. Stewart, 1217 Hurt Bldg., Atlanta, Ga.

FOR SALE or LEASE. 10 acres in Atoka Co., Oklahoma. NE¼, SW¼, SE¼, Sec. 9, Twp. 4 South, Range 13 East. Owner, James C. Barry, 3505 Legation St. N. W., Washington, D. C.

EAST TEXAS Trinity sand wildcats. Major Company blocks will start shortly. Two strikes recently made. Three others likely prospects next Sixty days. If you have some money and sense enough to give these Majors credit for having some sense, there's a likely chance you might make some quick money.
E. CROFT
Proctor, Texas.

Leases and Drilling Blocks

FOR SALE Oil and gas leases and small production located in Kentucky shallow field, and leases located in Clay County, Tenn. Have for sale two tracts of proven Fluorspar and Zinc deposits; reports furnished on request. W. P. Harley, Bowling Green, Kentucky.

NEW MEXICO
STATE OIL AND GAS LEASES
40 acres and multiples thereof. $6.00 to $60.00 per forty. Buy direct. Save those dollars. No middle man to pay; no salesman to bother you! Twenty years in the business without a complaint. Write for information.
HARRY S. WRIGHT
New Mexico State Lessee
Wright Bldg., Farmington, New Mexico.

REPRESENTING one of the famous Movie Actors, I want best oil producing interest $100,000.00 will buy. Reuben Usher, Cleburne, Texas.

IF YOU want your land or lease drilled on a partnership basis at no cost to you, write me. Send map showing location of land. Any state suitable. P. O. Box 1174, Longview, Texas.

FOR SALE: Large blocks wildcat oil and gas leases, in Counties with some oil and gas production. Long term, small rentals and low prices. W. P. HARLEY, Bowling Green, Kentucky.

FOR SALE
110-Acre lease. One Producing well. Consider trade for Real Estate or will farm out. Reason for selling not in any financial cond. to handle. Address Box K-541, The Oil and Gas Journal, Tulsa, Oklahoma.

WELL LOGS. Drillers' logs of approximately 4,000 wells drilled in New Mexico are available from Well Log Division, New Mexico Bureau of Mines & Mineral Resources, Socorro, New Mexico. Write for price list C.

240 ACRES center paying oil field Butler County, Kansas; lease for test. Arthur Nickell, Fayette, Missouri.

MUST SELL fee lease 2000 acres near Artesia, N. M. $5000; includes 850 ft. hole cased. Shallow area, estimated 1500 ft. Considerable adjacent government land available. Can furnish geologist report and structural map. P.O. Box #784, Albuquerque. New Mexico.

HAVE two drilling blocks Huerfano County, Colo. new field, no proration. One block 2500 acres in 3000 ft. area and small block in shallow field. Want make deal for development. S. W. Pressey, La Veta, Colorado.

HAVE Oil lease located next discovery well shallow field Huerfano County, Colo. Will sell interests for reasonable figure and drill commitment thereon. 3 oil stratas above 1200 ft. Drill starting. G. A. Horney, Box 614, Pueblo, Colorado.

Leases and Drilling Blocks

FOR SALE OR DRILLING PROPOSITION: 6000 acres long term, low rental Oil and Gas leases, South half Orange County, Indiana. Devonian, Trenton and St. Peter above 2700 feet. Lock Box 223, Robinson, Illinois.

WATCH GEORGIA—Geology-Geophysics working—Drilling—Sands — Traces — For drilling deals write C. W. Deming, Reg. Dealer. Wavcross, Georgia.

REMARKABLE terms, Texas land, 80 to 640 acres, oil possibilities, only $1 acre down. Balance 40 years. PAT CASEY, Houston, Texas.

MONTHLY INCOME FROM GAS
Five wells drilled four producers one dry. Shallow field. Pipelines in, market 7c net per 1000 cu. ft. Offset wells drilling. Single Interests one well or spread interests. Five wells available. Inquire
BOX 382
Osawatomie, Kansas.

REAL OPPORTUNITY—Drill my well deeper in central Loving Co. Texas pool. 4,100 ft. 7-in. o.d. casing in. $6,000 and rotary may get 5,000 bbl. oil like Ward, Winkler or Eddy counties. H. Freels, 251 So. Hill, Los Angeles, Calif.

Survey Service

REMEMBER EAST TEXAS
When all other methods fail, employ my divining or dowsing method. If oil exists this method finds it. Faults, broken treacherous areas accurately defined. Our Watson #2, first producer Wilmington, Calif. field, located by this method. More reliable than mechanical geophysics. Ask any unbiased oil authority. Many years' experience. A wise man investigates. George Miller, 1548 Post, Torrance, California.

Real Estate

FOR LEASE — Five to 10 years, shop now being used by Hydril Co.; two or more acres, all steel building with 15-ton crane, trackage, office building, all utilities, etc. Available April 15.
M. R. DUCEY, Owner
309 Webster, Houston, Texas.

Financing

CAPITAL SEEKERS
Put your project before 260 Kev-Men. Cost trifling. Details free. AMSTER LEONARD, Fox Theater Building, Detroit, Michigan.

JOHN MORRIS, Box 5411, Philadelphia, studied records 5000 financial houses. Found only 191 buy new issues. $4.00.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

Brokers—Salesmen

Sell in the most active area in the United States—The Permian Basin of West Texas and Southeastern New Mexico. From the standpoint of royalty investors this area has much to offer. Can supply you with choice non-producing royalties located on geophysical highs. Also drilling blocks, close in acreage to production, or wildcat leases. I maintain my own field men who cover this area for me. All offerings meet the requirements of the Security and Exchange Commission. Inquiries invited.

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

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WILDCAT OR PRODUCING
OIL ROYALTIES
Send Plat and Full Particulars
Immediate Action.
F. A. SANSOME, 522 5th Ave., New York.

PURCHASERS AND DISTRIBUTORS
PRODUCING ROYALTIES
Registered with S. E. C.
INVESTMENT ROYALTIES, LTD.
Ramsey Tower, Oklahoma City, Okla.

WALTER T. SCOTT
Tulsa, Oklahoma
Send inquiries for quotations and offering sheets on producing and non-producing properties.

Incorporations

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

CHARTERS — Delaware best, quickest, cheapest, more liberal. Free forms. Colonial Charter Co., Wilmington, Del.

CORPORATE ORGANIZING AND FINANCING—RE-ORGANIZATIONS
BROWN HARTWELL COMPANY
110 East 42nd Street, New York, N. Y.

For Sale—Maps

TEXAS and NEW MEXICO
UP-TO-DATE OIL DEVELOPMENT MAPS
Zingery Oil Map Co., Fort Worth, Tex.

R. B. ROBINSON MAPS
Jackson, Miss. 3-Hart Bldg., Across Street from Heidelberg Hotel. Ownership maps All Over Mississippi.

Ranches—Farm Lands

A REAL HOME
Where the winters are mild and the summers are breezy from the Gulf, where opportunities await you and yours. On the banks of the scenic Nueces River, good fishing, beautiful live oak trees, citrus orchard, pecan trees, barns, tenant houses, modern home, 150 acres of fertile soil that will grow heavy tonnage of vegetables and feed. Crops irrigated from strong well and the river. This farm is fully equipped for operation, teams, tools, registered herd, Hereford cattle, hogs. Owner has interest in other business and needs capital. Will sacrifice for immediate sale. No incumbrance against this farm. Near highway, good school, good county seat town. W. H. Wilson, Carrizo Springs, Texas.

Legal Blanks

SINCE 1908 Burkhart's legal forms—servicing Mid-Cont. oil fields, including Ill., La., Mo., Ind. & Ky. Free catalog & samples. Burkhart Ptg. & Sta. Co., 118 So. Cinn., Tulsa, Oklahoma.

CLASSIFIED ADVERTISING RATES

Classified advertising rates: First insertion, 35 cents a line; each additional insertion, 25 cents a line, PAYABLE IN ADVANCE. Six words usually make a line. Count as a word each one-letter word and each group of figures. White-space computed at regular line rate. Allow two extra lines for blind ads. Ads of less than three lines not accepted. No formal acknowledgement is made, and proofs cannot be shown in advance of publication.

	1 time	2 times	3 times	4 times		1 time	2 times	3 times	4 times
3 Lines	$1.05	$1.80	$2.55	$3.30	7 Lines	$2.45	$4.20	$5.95	$7.70
4 Lines	1.40	2.40	3.40	4.40	8 Lines	2.80	4.80	6.80	8.80
5 Lines	1.75	3.00	4.25	5.50	9 Lines	3.15	5.40	7.65	9.90
6 Lines	2.10	3.60	5.10	6.60	10 Lines	3.50	6.00	8.50	11.00

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1 Inch	13 times	4.50 per inch
1 Inch	26 times	4.00 per inch
1 Inch	52 times	3.50 per inch

This space may be contracted for over a period of one year from the date of the first insertion and is PAYABLE IN ADVANCE, MONTHLY.

We reserve the right to withhold all advertising of questionable character. To avoid delay be sure to send remittance with copy. We will set your ad in the smallest amount of space possible and refund all overpayments. One-time insertions will not be run until fully paid. Forms close MONDAY NOON before each issue date.

THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

WROUGHT IRON PIPE

12,000 feet 12¾" OD—¼" Wall—34#
10,000 feet 15½" OD—5/16" Wall—51#
8,000 feet 20" OD—11/32" Wall—71½#
6,700 feet 24" OD—⅜" Wall—95#

All in 25 ft. lengths—Priced for quick sale

WIRE *PHONE* *WRITE*

SONKEN-GALAMBA SUPPLY COMPANY

W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

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25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio

FOR SALE: Orifice and Positive Gas Meters. GEO. R. MILNER, Okmulgee, Oklahoma.

FOR SALE cheap at Oklahoma City, 16" O.D. 28# and 20" 35# Naylor Plain end Spiralweld pipe, suitable for surface pipe. I.T.I.O. Company, Bartlesville, Oklahoma.

PORTABLE Drill, 2000' capacity, new G-D FXG pump, wire line winch and 500' 2⅜" Hughes Joint drill pipe. Built Nov. 1939 and in A-1 shape. Address Box K-530, The Oil and Gas Journal, Tulsa, Okla.

ONLY $22.50 NET TON!
(Carload Quantities)
Tubes, Steel Condenser, Used 150 tons, 5" O. D. ⅜" x ½" walls.
Other Pipe, Flues & Tubes also available.
IRON & STEEL PRODUCTS, INC.
13412 S. Brainard Avenue,
Chicago, Illinois.
"Anything containing IRON or STEEL"

ELECTRIC Welders—Lincoln Arc, rebuilt, gasoline engine driven; capacities 200, 300 and 400 amp.; low prices.
FUNKHOUSER EQUIPMENT CO.,
2425 Jefferson St., Kansas City, Mo.

FOR SALE: At Seminole 15,000 Ft. good used ⅞ x 25' double sucker rods. I.T.I.O. Co., Bartlesville, Okla.

NOTICE — CABLE TOOL CONTRACTORS, Save money; used wire lines. All sizes up to 5,000 ft. long. See us before you buy. General Tool & Supply Co., P.O. Box 4387, Oklahoma City, Oklahoma.

SETTLE ESTATE, sacrifice 160-acre Placer gold prop. dredge fully equipped; net $5,000 mo.; N. Calif.; $50,000. Terms. Also rich gold quartz mine invet. H. Freels, 251 So. Hill, Los Angeles, Calif.

"Motorists Save" with LUBRICATING GAS-O-LINE
ORIGINAL AND GENUINE
ADMIXTURE
Softens, Knock and Ping
Protects Motor — Saves Repairs
Corrects Sticky Valves and Carbon Trouble
One doz. 2½-oz. "Handy Containers" treats 120 gallons gasoline, price delivered $3.75. Quarts $2.00, Pints $1.25, Half-pints $1.00. Gallons $5.00, Quarts $3.00, 2 gallons $10.00.
HERE IT IS: Instant, dynamic, split-second get-a-way motor performance, at no extra cost. Increased mileage pays for it. Makes cheap gasoline good and high-test gasoline better; and most powerful gasoline on American market. Prove it for yourself on guarantee,—satisfaction or money back. Order NOW—it means thrift and economy as well as a thrill.
Lubricating Gasoline Co.
P. O. BOX 820 HOUSTON, TEXAS

FOR SALE: 7 Ft. x 20 Ft. Butane welded storage tanks 125# WP, capacity 6000 gallons. I.T.I.O. Co., Bartlesville, Okla.

FOR SALE

25,000 ft. of 4" seamless drill pipe equipped with both full hole and regular tool joints.
10,000 ft. of 7" 24# seamless casing, once run.
5,000 ft. of 7" 26# seamless casing, once run.
10,000 ft. of 2½" seamless tubing, used for flowing wells only.
We also have several complete drilling rigs, one with Unitized Draw Works capable of drilling 6,500 ft. The above is located in Shreveport, Louisiana.
We also have 30,000 ft. of 6" screw line pipe located in Oklahoma.
Wire, Write or Phone for Prices

Louisiana Iron & Supply Co.
Shreveport, Louisiana

FOR SALE—$80,000.00 Rotary Rig complete. 10-in. Emsco Unit, 125-350 Boilers, etc. Practically new. Bargain. Roberts Bros., Box 306, Tyler, Texas.

FOR SALE: One set new, two sets slightly used 6½" Spang weldless drilling jars 3¼"—4¼"—7 in. I.T.I.O. Co., Bartlesville, Oklahoma.

FOR SALE: Star #28 beam steam machine lines and tools complete. Box 592, Emporia, Kansas.

If we do not maintain a classification exactly suited to the type of advertisement you wish to run we shall be glad to create a fitting one.
Classified Department.

FOR SALE: One used Casperson and Handley type Core or Shot Hole Drill and tools. Mounted on Ford truck. D. A. Hurst, P.O. Box 746, Brenham, Texas.

FOR SALE
COMPRESSORS

From 100# to 2,000# discharge pressures in capacities from 100 cu. ft. to 3000 cu. ft. per minute either belted or direct connected gas, electric or Diesel types.

ELECTRIC MOTORS
25 Cycle to 60 Cycle
From 5 to 250 HP

ENGINES
Gas & Diesel
From 25 to 500 HP

PULLEYS
Split steel, all sizes.

L. F. SMITH COMPANY
217 W. Archer
Tulsa, Oklahoma

We guarantee the condition of all equipment rebuilt in our shops.

FOR SALE at Oklahoma City Warehouse, large quantity 4¾" o.d. 16#, 5" o.d. 15# slotted-perforated liner and Stancliff screen pipe. I. T. I. O. Company, Bartlesville, Okla.

SHALE SEPARATORS
Special reduced prices on new and used shale separators.
New Hudson-Boucher automatic $500.00
Used McNeely shale shaker $300.00
LUCEY PRODUCTS CORPORATION
Tulsa, Oklahoma

FOR SALE: At Oklahoma City warehouse, cheap, 60-4" 8 V thd. Fairbanks, Figure 0828, 200# working pressure screw sphero quick opening gate valves. I.T.I.O. Company, Bartlesville, Oklahoma.

Equipment Wanted

WANTED: 180 H.P. Superior or Cooper slow speed gas engine. P. O. Box 43, Tuscola, Illinois.

Help Wanted

PETROLEUM Engineer with successful sales experience in oil well pumping equipment. Preferably under 35 years of age. Qualifications and full particulars desired in first letter. Strictly confidential. Address Box K-491, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMIST with degree from a university and at least three years' experience in a petroleum refinery control laboratory desired by a modern central state refinery. Address Box K-542, The Oil and Gas Journal, Tulsa, Oklahoma.

GOOD salesman can own supply business for $700 cash and good reference. Several articles away ahead anything on market. You're protected by patents and territory. You need coupe, we furnish special trailer. Liberal commission. P. O. Box 142, Tulsa, Oklahoma.

Situations Wanted

REFINERY ENGINEER, Ch.E., Ph.D., married, 19 years' diversified experience in lub oils, thermal and catalytic reforming and cracking, polymerization, hydrogenation and alkylation processes and engineering design. Desires position with oil company interested in progressing along catalytic lines. Box K-494, The Oil and Gas Journal, 415 Lexington Ave., New York City, N. Y.

EXPERIENCED Salesman—Purchasing Agent, 15 years in oil country. Full knowledge of jobber and factory representations. Address Box K-532, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST—ENGINEER
Wide domestic and foreign experience with major oil companies seeks connection. Address
Box K-531
The Oil and Gas Journal, Tulsa, Okla.

REFINERY Process Engineer, Chemical Engineer, 20 years diversified industrial experience including process research, development, design, consultation, refinery operation. Capable executive; excellent record in handling labor and lowering production costs. Outstanding ability to analyze refinery requirements and processes. Desires position as refinery executive in operation or engineering. Address Box K-534, The Oil and Gas Journal, Tulsa, Okla.

REFINERY INSTRUMENT MAN. Young, capable, with over 10 years' practical experience in charge of refinery instrumentation. Experienced in the many brands and types used by the industry and a specialist at training men for this work. Address Box #540, The Oil and Gas Journal, Tulsa, Oklahoma.

Mailing Lists

ROYALTY Lists. Oil Investor Lists. Stockholders Lists. By States. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa.

DIRECTORY of the Illinois Oil Basin now going to press. Write Midwest Oil Journal, Box 381, Centralia, Illinois.

ROYALTY, lease and oil investors in any state. Catalogue. Flory Co., Box 105, Fort Worth, Texas.

New York Market

(Continued from Page 119)

tral oil is apparently improving slightly but shipping instructions are still on the conservative side.

Gulf Coast Markets

HOUSTON, Tex., Mar. 19.—Increased demands for kerosene, fuel oil and burning oil and a growing weakness in gasoline were the high points in the week's refinery markets on the Gulf Coast.

Kerosene continued to be the strongest spot in the market. Stocks were reported exhausted and suppliers reported that several buyers were begging for material. Such material as was available moved at 4¾ cents or better.

Fuel and burning oils had a firmer tone. Material was limited and some sellers reported they were unable to supply all requirements. Although several cargoes of Bunker C fuel material were reported loaded at 80 to 85 cents, this was not interpreted as an indication of weakness, for sellers who had material on hand were not finding it difficult to move under the prevailing quotation at 90 cents to $1. Bunker C fuel in bunkers continued to be quoted at 90 to 95 cents.

No improvement was evident in the gasoline market, and most sellers continued to accept almost any bid within reason for material on firm orders.

Tank-Wagon Changes

(Continued from Page 120)

New York. Points affected: Albany, metropolitan New York, Syracuse, Portland, Manchester, Burlington, Boston, Worcester, Hartford, New Haven, Providence; March 14, reduced dealer tank-wagon gasoline in Albany 0.1 cent; Portland, 0.3 cent; Manchester, 0.8 cent; Worcester, 0.2 cent; New Haven, 0.5 cent; Providence, 0.3 cent; on the same date reduced consumer tank-car gasoline 0.1 cent in Manchester.

Atlantic Refining Co. March 5 reduced dealer tank-wagon gasoline 0.5 cent in Philadelphia; March 14, reduced it 0.7 cent further; March 8 reduced dealer tank-wagon gasoline 0.5 cent in Wilmington.

Standard Oil Co. (Indiana) March 13 advanced dealer gasoline 1.4 cent in Grand Rapids.

Mississippi Fields

(Continued from Page 114)

No. 1 Columbia Mutual Life Insurance Co. in Section 19-1n-3w, Copiah County, is moving in material on an 8,000-acre block for a 6,000-ft. test. In Holmes County, Allied Pipe Line Co. has let contract to drill No. 1 Ellis, Section 18-14n-4e, a 5,000-ft. test, and rig is being moved onto location.

The third wildcat scheduled for Madison County, Ryan and Anderson's No. 1 Parkinson, Section 23-9n-1w, has spudded. This will be a 5,000-ft. test, drilled on a block assembled on seismograph data. The fourth new wildcat of the week, Hill & Hill and W. L. Stewart's No. 1 Kalmia Realty Co., Section 5-7n-9w, Wayne County, has spudded and is awaiting a rig from one of the Yazoo County wildcat operations. This test, in the southeast section of the state near the Alabama State line, will drill to 6,500 ft. on a 10,000-acre block which has been surveyed by core drilling.

MISSISSIPPI COMPLETIONS

Tinsley—Yazoo County

Hassie Hunt's No. 1 A. G. Johnson, C NE NE Section 14-10-3, missed Woodruff and Stevens sands, set 7-in. casing 4,886 ft., perforated 4,778-4,804 ft. in stray sand of Eutaw formation. Ran 2½-in. tubing to 4,768 ft. Initial production 480 bbl., 1-in. choke, tubing pressure 1,250 lb., no casing-pressure gage. Total depth 4,890 ft. Jones & O'Brien's No. 1-C Stevens, C SE NE Section 11-10-3, temporarily abandoned 4,815 ft.; set plug 1,700-1,500 ft.

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